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Biological and Species Interaction Survey of Pacific Hake, Sablefish, Spiny Dogfish and Pacific Herring Off the Southwest Coast of Vancouver Island. F/V *CALEDONIAN*, August 12-25, 1986

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BIOLOGICAL AND SPECIES INTERACTION SURVEY OF PACIFIC HAKE, SABLEFISH, SPINY DOGFISH AND PACIFIC HERRING OFF THE SOUTHWEST COAST OF VANCOUVER ISLAND. F/V CALEDONIAN, AUGUST 12-25, 1986

by

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ABSTRACT

Shaw, W., R. Tanasichuk, D. M. Ware, and G. A. McFarlane. 1989. Species interaction and biological survey of Pacific hake, sablefish, spiny dogfish and Pacific herring off the southwest coast of Vancouver Island. F/V CALEDONIAN, August 12-25, 1986. Can. MS Rep. Fish. Aquat. Sci. No. 2012: 134 p.

A biological and species interaction study was conducted near La Pérouse Bank, and in some of the major coastal inlets of Vancouver Island from August 12-25, 1986. Thirty-nine trawl hauls were completed. Pacific hake and sablefish were the dominant species in midwater and bottom trawl catches respectively.

Large hake concentrations occurred in the Bottleneck, at the Firing Range and along Finger Bank, extending southward towards the 200 m isobath. Substantial concentrations of small hake were found in Tahsis and Sydney Inlets, Nootka Sound and Trevor Channel. Important dietary items (% volume) for offshore Pacific hake were euphausiids (78%) and Pacific herring (9%) whereas hake in the coastal inlets fed mainly on euphausiids (65%). Pacific herring accounted for only 3% of the diet of hake in the inlets. Offshore hake ranged between 30 and 71 cm with modes at 45 and 47 cm for males and for females respectively; inshore hake were between 16 and 69 cm long with modes at 21 cm in Tahsis Inlet and 35-36 cm at the other locations. Offshore catches were dominated by 6- and 9-year-old fish.

Pacific herring juveniles and adults were most common on Forty Mile Bank, and juveniles on Swiftsure Bank. Juveniles were collected at the Firing Range and in Barkley Sound as well as Sydney and Shelter inlets. Few herring were feeding; most had empty stomachs and those with food contained small amounts of euphausiid or unidentified digested material.

Biological results of other species sampled are presented.

Oceanographic results indicated that the water along the coast was relatively warm and fresh, apparently due to outflow from the Juan de Fuca Strait. Current vectors indicated the existence of a counter-clockwise circulation (the Juan de Fuca eddy) southwest of La Pérouse Bank.

RÉSUMÉ

Shaw, W., R. Tanasichuk, D. M. Ware, and G. A. McFarlane. 1989. Species interaction and biological survey of Pacific hake, sablefish, spiny dogfish and Pacific herring off the southwest coast of Vancouver Island. F/V CALEDONIAN, August 12-25, 1986. Can. MS Rep. Fish. Aquat. Sci. No. 2012: 134 p.

Une étude des caractéristiques biologiques et des interactions des espèces a été effectuée près du banc La Pérouse et dans certains des principaux inlets côtiers de l'île de Vancouver entre le 12 et le 25 août 1986. Trente-neuf traits de chalut ont été effectués. Le merlu du Pacifique et la morue charbonnière sont les deux espèces dominantes, capturées respectivement en eau mi profonde et en eau profonde.

De grosses concentrations de merlu sont observées dans l'entonnoir, dans la chaîne Firing et le long du banc Finger, et s'étendent vers le sud jusque vers l'isobath de 200 m. Des concentrations importantes de petits merlus ont été observées dans les inlets Tahsis et Sydney, dans le détroit Nootka et dans le chenal Trevor. Parmi les composantes importantes du régime alimentaire (% par volume) du merlu du Pacifique au large, mentionnons les euphausiidés (78 %) et le hareng du Pacifique (9 %); le merlu des inlets côtiers se nourrit surtout d'euphausiidés (65 %). Le hareng du Pacifique ne constitue que 3 % du régime alimentaire du merlu dans les inlets. La longueur des merlus du large variait entre 30 et 71 cm, avec des dominantes à 45 et 47 cm respectivement pour les mâles et les femelles; la longueur des merlus du littoral variaient entre 16 et 69 cm, avec dominante à 21 cm dans l'inlet Tahsis et à 35-36 cm dans les autres endroits. Les prises au large étaient constitutées surtout de poissons âgés de 6 à 9 ans.

Les harengs du Pacifique jeunes et adultes sont l'espèce la plus courante dans le banc Forty Mile et les jeunes dans le banc Swiftsure. Des jeunes poissons ont été capturés dans la chaîne Firing et dans le détroit Barkley ainsi que dans les inlets Sydney et Shelter. Peu d'entre eux se nourrissaient dans ces endroits; l'estomac de la plupart des poissons était vide et ceux qui contenaient de la nourriture contenaient de petites quantités d'auphausiidés ou de matières digérées non identifiées.

Les résultats de l'étude biologique d'autres espèces échantillonnées sont présentés.

D'après les données océanographiques, l'eau le long de la côte était relativement chaude et douce, semble-t-il à cause de l'apport des eaux du détroit Juan de Fuca. Les vecteurs de courants révélaient l'existence d'une circulation en sens inverse des aiguilles d'une montre (tourbillon Juan de Fuca) au sud-ouest du banc La Pérouse.

INTRODUCTION

This survey is a major component of the La Pérouse Project. It is designed to evaluate the influence of variations in both the physical and biological oceanography on fish populations utilizing the lower west coast of Vancouver Island. Fisheries issues of interest include the influence of variations on groundfish species, in particular Pacific hake (Merluccius productus), and Pacific herring (Clupea harengus pallasi) recruitment. Large schools of hake enter Canadian waters in late May and remain until late November. While there, they become a very important predator of Pacific herring stocks off the southwest coast of Vancouver Island.

The first hake-herring interaction survey in 1985 (Shaw et al. 1987) outlined the distribution of both hake and herring off Vancouver Island, in particular the La Pérouse Bank. It provided preliminary dietary information on the impact of hake and other predators, such as sablefish (Anoplopoma fimbria) and spiny dogfish (Squalus acanthias), on Pacific herring. In addition, measurements of water properties (temperature, salinity, density) were made and zooplankton samples were collected.

The main objectives of the 1986 survey were to sample major concentrations of hake and herring off the southwest coast of Vancouver Island, map their distribution, determine diets of major fish species, delineate the northern limit of hake distribution off Vancouver Island, and collect physical oceanographic data from the survey area.

This report contains the biological and oceanographic data collected during the survey which was conducted from August 12 to 25, 1986.

MATERIALS AND METHODS

FISHING

The F/V CALEDONIAN, a 30 m (100 ft) commercial stern trawler powered by a 900 hp diesel engine, was chartered for the survey. Fishing operations were conducted with two types of trawl gear. Demersal tows were made with an Atlantic Western II box trawl with two 907 kg (2000 lb) steel trawl doors. Midwater tows were made with a Diamond VIII midwater trawl equipped with a headrope transducer. The same codend (10.2 cm stretched mesh) and small mesh liner (3.8 cm stretched mesh) was used for both nets. Average vertical mouth openings of the bottom and midwater trawls were approximately 5.5 m and 18 m respectively.

Set locations for midwater trawling were selected on the basis of fish density in the midwater as determined from echo sounder results. Bottom trawl sets were made on trawlable bottom in the survey area. Not all of our sets were made near schools of Pacific herring.

In addition to the offshore survey, fishing and echosounding were conducted in inlets to investigate commercial airline pilots' and sports fishermen's reports of unusually high concentrations of small fish schools. Pacific Biological Station staff flew over the area from Barkley Sound to Sydney Inlet on August 15 to investigate these reports. Approximately 80 schools estimated to average 100 tonnes each were sighted inside Barkley Sound, 60 schools in Clayoquot Sound, and 28 schools in Shelter Inlet. The charter vessel surveyed Clayoquot and Nootka sounds and Tahsis and Esperanza inlets on August 17 and 18, and Barkley Sound on August 25, to determine the species composition of these schools.

BIOLOGICAL SAMPLING

The total catch for each tow was determined by visually estimating the weight of fish in the codend. The weight by species was calculated after assigning percentage of the total catch to that species. Representative subsamples were collected from large catches using a six-tub subsample method (2 tubs each from the beginning, middle and end of the codend), while small catches were sampled in their entirety.

Length, sex and stomach contents were recorded for all fish species; in addition, maturity stages of hake were noted (Weir et al. 1978) and otoliths were taken for age determination (Beamish 1979). Length measurements consisted of fork length for hake and sablefish; total length (tip of the snout to the tip of the caudal fin when depressed in a line horizontal with the body) for spiny dogfish; and, standard length (tip of the snout to the hind margin of the hypural bone of the tail) for herring. An attempt was made to examine a minimum of 10 stomachs per sex and centimetre interval for each species from each haul. Prey items were identified to the lowest possible taxon and volume in each stomach determined (Shaw et al. 1987). State of digestion was also recorded. Standard length of herring found in the stomachs of fish examined on board the vessel was measured. In addition to examining stomachs at sea, a maximum of 100 full stomachs each from hake, sablefish and dogfish were collected from each species-specific series of body length intervals. These stomachs were preserved in 10% buffered formalin for subsequent laboratory analysis.

Random samples of herring from selected tows were put into buckets, frozen and brought back to the laboratory. These fish were sampled for standard length, total weight and stomach contents, and scales were removed for age determination.

A sample of smaller sized hake caught in inlets was quick frozen and brought back to the laboratory to examine parasite content in the flesh.

OCEANOGRAPHIC SAMPLING

Physical oceanographic data were collected at the end of 5 bottom and 23 midwater trawl sets (Table 1) using a STD-12 (Applied Microsystems Ltd., Sidney, B.C.) oceangraphic probe. Water properties such as temperature, salinity and density were sampled every 2 metres (see Shaw et al. 1987).

RESULTS AND DISCUSSION

FISHING AND ECHOSOUNDING

Thirty-nine trawl hauls were completed. Thirteen bottom tows were made between August 12 and 15, and 26 midwater tows between August 16 and 25. The La Pérouse Project fishing subareas are illustrated in Figure 1 and the following is a summary of tows by subarea:

	No. of tows	
Fishing Subarea	Bottom trawl	Midwater Trawl
Barkley Sound		1
Firing Range		3
Cabbage Patch		1
Subarea 5		2
40 Mile Bank	1	2
Finger Bank	6	1
Bottleneck	1	
Swiftsure Bank		2
Eddy	2	9
Subarea 12	3	
North Slope		1

Additional midwater tows were conducted in some of the inlets along Vancouver Island (Barkley Sound, Shelter Inlet, Sidney Inlet, Nootka Sound, and Tahsis Inlet). Fishing locations are illustrated in Figure 2. Detailed catch data by set is presented in Appendix Table 1.

Thirty-eight species of fish were captured during the survey. A list of common and scientific names of the species caught is given in Table 2. The total catch by species during the survey was:

Species	Weight (kg)	% Total catch
Pacific hake	34342	48.9
Spiny dogfish	28855	41.1
Sablefish	2167	3.1
S. paucispinis	962	1.4
Pacific herring	840	1.2
Other species	3059	4.3
Total	70225	100.0

Total weight of each species in the "other species" category was less than 1% of the total catch.

During bottom trawling, the major species caught in the shallower (100 m) regions of the La Pérouse Bank were adult sablefish and in the deeper waters, towards the 200 m isobath, Sebastes reedi and Sebastes diploproa. Pacific hake dominated the midwater catches.

The distribution and biological sampling results by species is discussed below:

PACIFIC HAKE

Offshore waters

Echosounder results indicated large midwater concentrations of Pacific hake occurred in the Bottleneck, Firing Range region, and adjacent to Finger Bank extending into the Eddy region easterly towards the 200 m isobath (US-CDN International border) (Fig. 3). Hake concentrations decreased while echosounding up the coast with no hake seen past Nootka Sound.

Pacific hake were present in 73% of the midwater sets and 77% of the bottom sets. Biological samples were taken from 26 sets (16 from midwater sets, and 10 from bottom sets). A total of 2493 hake was measured for length, and sexed. Maturity states for 555 fish were recorded. Paired otoliths were removed from 512 fish for ageing. A total of 2026 stomachs was analysed aboard the vessel, and 68 stomachs were collected for laboratory analyses. A summary of the biological sampling is given in Table 3.

Hake caught during the survey ranged from 30 to 71 cm long. Hake in the bottom trawl catches ranged from 30 to 71 cm (females) and from 39 to 56 cm (males). Modes occurred at 48 cm for females, and from 46-47 cm for males (Appendix Table 2, Fig. 4). Hake in the midwater trawl catches ranged from 31 to 70 cm for females and from 35 to 67 cm for males. Modal lengths were slightly smaller in the midwater trawl catches, females at 47 cm and males at

45 cm. These results are consistent with those presented by American scientists (National Marine Fisheries Service-NOAA) conducting the 1986 Pacific hake triennial survey from Monterey Bay, California to Vancouver Island (NOAA, Cruise Results, Cruise No. 86-08). Approximately 5% and 3% of the females sampled in the bottom and midwater trawl catches respectively, were $\geq$ 60 cm. No males measuring 60 cm or longer were caught in the bottom trawl sets; only 0.6% were caught in the midwater trawl catches. These results are similar to the 1983 and 1985 survey results (Shaw et al. 1985 and 1987 respectively). Female hake accounted for 64% of the the bottom trawl catches and 60% of the midwater trawl catches.

Pacific hake (sets 14, 25, 27 and 38) ranged from 2-17 years of age (Table 4). Age 6 and 9 fish (1980, 1977 year-classes, respectively) (Fig. 5) predominated and accounted for 59% and 18%, respectively, of all hake sampled. The strong 1970 and 1973 year-classes were still evident.

Growth rates were relatively rapid in the younger ages to age 3 (Fig. 5). Growth curves for males and females were fitted using the following von Bertalanffy parameters:

	to	K	L (cm)
Males	-6.76	0.168	54.2
Females	-3.02	0.221	56.7
Sexes combined	-3.82	0.211	55.5

A total of 196 males and 259 females were examined for maturity states (Table 5). Seventy-six percent of the males were in an early ripening (R1) stage, and 23% were in a resting (Rt) stage. Approximately 25% and 74% of the females were in stages R1 and Rt respectively.

Although body weights of hake were not measured during the field study, a stratified length-age-weight sample for hake was collected in mid-July. The resulting length-weight and age-weight should provide reasonable weight estimates for fish collected in August. These equations are:

Length/weight

Males	Wt(gm)	=	0.1311 (FL(cm))	2.2290	n = 97
Females	Wt(gm)	=	0.0259 (FL(cm))	2.6559	n =167
Sexes combined	Wt(gm)	=	0.0278 (FL(cm))	2.6345	n =264

Age/weight

Males	Wt(gm)	=	364.93 (Age(yr))	0.3807	n = 68
Females	Wt(gm)	=	331.02 (Age(yr))	0.5296	n = 95
Sexes combined	Wt(gm)	=	313.14 (Age(yr))	0.5191	n =163

Stomach samples for prey identification were stratified in the offshore waters north and south of 49°00' latitude. The northern region included offshore waters to Clayoquot Sound; the southern region included the

La Pérouse Bank. The principal prey (% by volume) identified in the stomachs collected from the northern region was euphausiids (94%) (Table 6). No Pacific herring were found in hake stomachs from this area. Stomachs collected from the southern region contained primarily euphausiids (78%) of which the majority were Thysanoessa spinifera. Pacific herring was the next most important food item, accounting for 10% by volume. A total of 34 herring were found in 34 hake stomachs. Thirty-one of those herring were measurable and ranged in length from 8 to 21 cm ($\bar{X}$ = 13.7 cm) (Table 7). One-third of the herring were from set 36, off Amphitrite Point. No herring were identified in the hake stomachs from catches in the vicinity of the 200 m isobath. If hake with empty or everted stomachs were ignored, then approximately 3% of the hake sampled during this survey contained Pacific herring. Large hake (>60 cm) preyed mostly on fish, whereas small hake (<40 cm) preferred invertebrates such as euphausiids.

The average volume of food per stomach (excluding empty or everted stomachs) for hake caught offshore from the northern region was 5.5 cc, and 11.4 cc for hake from the southern region.

Inshore waters

Echosounding results indicated that large concentrations of hake were present in Trevor Channel (Barkley Sound) and Nootka Sound. Smaller concentrations were observed in Tahsis Inlet.

A total of 571 hake was measured and sexed. Maturity states were recorded from 234 fish. Paired otoliths were collected from 236 fish for age. A total of 235 stomachs was analyzed aboard the vessel. A summary of the biological samples collected is presented in Table 3.

There were differences in the size composition of hake collected at the various locations. Hake from Tahsis Inlet, Nootka Sound, Sidney Inlet and Trevor Channel ranged from 16 to 74 cm and had a modal length of 35-36 cm whereas hake from Tahsis Inlet were 16 to 64 cm long with a modal length of 21 cm (Appendix Table 2, Fig. 6).

The age composition of hake from inshore waters is presented in Figure 7. Tahsis Inlet contained mostly 1+ year old fish. In Nootka Sound the age composition ranged from 2 to 10 years with modes at 4, 6 and 9 years (1982, 1980 and 1977 year-classes, respectively). Hake in Trevor Channel were from 3 to 16 years with modes at 3 and 5 years (1983 and 1981 year-classes respectively).

Maturity stages differed between sampling locations (Table 5). Most hake in Tahsis Inlet were immature (I2). In Nootka Sound and Trevor Channel the majority of the hake were in an early ripening stage (R1) with a few immature fish (I2). Closer examination of the hake gonads collected from fish in Nootka Sound and Trevor Channel indicated that the maturing fish (R1) were recruit spawners, i.e., fish maturing for the first time.

Stomach samples for prey identification were stratified for the inshore areas north and south of 49°00' latitude. The northern region included inlets north of Barkley Sound; while the southern region included all areas inside Barkley Sound. Fish was the main diet for all size categories of hake collected inside the northern inlets (Table 8). The principal food item (% by volume) was unidentified fish remains, accounting for 39%. One hake stomach contained 5 young-of-the-year herring at 8 cm (set 16, Table 7). Large schools of Northern anchovy (Engraulis mordax mordax) were found inside Shelter Inlet and consequently they were also identified as a prey item for hake. Stomachs collected from the southern region contained primarily euphausiids (96%) (Table 8). Herring were not found in the stomachs collected in Barkley Sound. The average volume of food per stomach (excluding empty or everted stomachs) for hake from the northern region was 13.3 cc, and 3.9 cc from the southern region.

Results of the parasite analysis for hake collected inside Tahsis Inlet and Trevor Channel are presented in Table 9. The parasite Kudoa paniformes (Kabata et al. 1985) was absent from the Tahsis Inlet hake sample, and found in only one fish (58 cm) from Trevor Channel. The parasite Kudoa thyrsites predominated in the Trevor Channel samples while the majority of the hake in Tahsis Inlet did not contain either parasite.

SABLEFISH

Sablefish were caught only in the bottom trawl tows and were present in 92% of the sets. Most of the sablefish were caught on 40 Mile Bank and on the eastern edge of the Finger Bank. Biological samples were taken from all tows. A total of 346 sablefish was measured for fork length and sexed. Stomachs from 251 fish were examined at sea. An additional 91 stomachs were collected for laboratory analyses. A summary of the biological sampling is presented in Table 10.

Sablefish ranged in length from 35 to 83 cm, similar to the 1985 survey (Shaw et al. 1987) (Appendix Table 3; Fig. 8). Males ranged from 35-74 cm and females from 35-83 cm. The majority of the small fish (35-55 cm) were caught at 40 Mile Bank (set 13) whereas most of the large fish (55-76 cm) were caught west of the Finger Bank (set 12). Small sablefish <55 cm accounted for 39% of the total catch from all areas. Males accounted for 62% of the total sablefish catch and dominated in 67% of the sets.

Stomach samples were collected only from the southern offshore region in the vicinity of the La Pérouse Bank. The principal prey (% by volume) identified in the sablefish stomachs containing food were unidentified fish remains and euphausiids (26% each), and lingcod (25%). Two herring were identified in 2 sablefish stomachs. Herring accounted for only 0.8% of sablefish prey volume. If empty or everted stomachs were excluded then less than 1% of the sablefish consumed herring. Hake and rockfish heads were found in the sablefish stomachs. These heads were cut off and presumably are a result of dumping by the foreign factory vessels operating in the vicinity during the offshore hake fishery.

Most of the smaller fish (<50 cm) fed mainly on euphausiids whereas larger sablefish (>50 cm) contained mostly unidentified fish remains followed by lingcod remains and then Pacific hake. The average volume of food per stomach (excluding empty or everted stomachs) was 57.7 cc.

SPINY DOGFISH

The majority of dogfish were caught around Finger Bank and 40 Mile Bank in the bottom trawls, and around the Pot Holes, Eddy, and Swiftsure Bank in the midwater trawls. Spiny dogfish were present in 54% of the bottom sets and 54% of the midwater sets. Of the midwater sets, 2 were made inside Sydney and Shelter Inlets. Biological samples were collected from all sets. A total of 799 dogfish was measured for length, and sexed. Stomach contents were examined from 725 fish. An additional 39 stomachs were collected for laboratory analyses. A summary of the biological samples collected is presented in Table 12.

Dogfish caught in the bottom trawl gear ranged in length from 50 to 99 cm, and from 39 to 107 cm in the midwater trawl gear (Appendix Table 4; Fig. 9). Modes in the length frequency for dogfish were at 64 and 83 cm for fish caught in the midwater tows and at 69 cm for dogfish captured in the bottom tows. Juvenile dogfish ($\leq$ 60) cm appeared to be more abundant in the midwater catches (25% of the total numbers) than in the bottom trawl catches (20%). Male dogfish accounted for 54% of the total dogfish catch and dominated 63% of the sets.

Stomach samples were collected only from the southern offshore region in the vicinity of La Pérouse Bank and from the northern inshore area. The principal prey (% by volume) for dogfish from the southern region was euphausiid (31%), and Pacific herring and unidentified fish remains each at 15% (Table 13). Twenty-four Pacific herring were identified in 19 stomachs. These herring ranged from 12 to 25 cm ($\bar{X}$= 16.7 cm) (Table 14). The majority of the herring were found in the larger dogfish (>80 cm); while most of the smaller dogfish (<60 cm) consumed euphausiids. Stomachs collected from the northern inshore area contained primarily eulachon (Thaleichthys pacificus) (75% by volume) (Table 15). Pacific herring were identified in 6 stomachs and accounted for 11% of the total volume. Four of these herring were measurable and they ranged in length from 13 to 15 cm (Table 14). As for the offshore areas, the majority of the herring were found in the larger dogfish (>80 cm). Excluding empty stomachs, approximately 5% and 12% of the dogfish from the southern offshore and northern inshore areas, respectively, consumed herring. The average volume of food per stomach (excluding empty stomachs) for dogfish caught offshore in the southern region was 26.5 cc, and 59.2 cc for dogfish in the northern inshore area.

PACIFIC HERRING

Offshore waters

Echosounder results indicated good concentrations of herring on 40 Mile Bank at bottom depths of 73 m, and on Swiftsure Bank near the Eddy region at bottom depths of 91 m (Fig. 2). Minor concentrations were seen near the Firing Range and at the seaward end of 12 Mile Bank.

Herring were caught in only 5 midwater tows. A summary of the samples collected is presented in Tables 16 and 17.

Various age-classes of herring were found at specific locations off Vancouver Island. An unpublished length-at-age relationship suggests that all fish between 9 and 17 cm are 1+ and herring between 17 and 19 cm are age 2+. Consequently, 97% of the herring captured at the Firing Range were juveniles (1+ years old). Juveniles also dominated in the set (No. 24) made at Swiftsure Bank. Juveniles (ages 1+ and 2+) and adults were collected at 40 Mile Bank. In Set 23, all but one fish were longer than 17 cm and therefore should have been 2+ or older. In contrast, 78% of the fish in Set 37 were of lengths which suggested that they were age 1+. Results of detailed biological sampling (Table 17) support the length-at-age plot and also indicate that most of the fish collected on 40 Mile Bank (Set 23) were age 3+ or 4+ (47.4 and 31.6%, respectively). Although no 0+ fish were trawled, several were found in stomachs of hake collected on the Firing Range and in Barkley Sound (Set 39).

Stomach examinations made at sea indicated that few herring were feeding. All of the 40 fish from 40 Mile Bank (Set 23) selected for stomach examination had empty stomachs. Two of the 18 fish from Firing Range (Set 36) contained food (1 cc of euphausiid or digested material). Eight of the 20 fish taken in Set 37 had food in their stomachs which, in general, consisted of less than 1 cc of well digested euphausiid or digested material.

Inshore waters

Large concentrations of herring were found in Nootka Sound at 109 m and in Sidney Inlet between 27 and 46 m bottom depth. In addition, a large fish concentration was encountered at the mouth of Shelter Inlet, at depths ranging between 51 and 73 m. The catch from set 16 indicated that these fish were Northern anchovy (*Engraulis mordax mordax*).

Herring caught in Sydney and Shelter Inlet ranged from 9 to 19 cm (Table 16). Based on an unpublished length-at-age plot, all fish <17 cm would be juveniles (1+ years old).

OTHER SPECIES

A summary of the other species sampled is presented in Table 18. The length frequencies for lingcod, Pacific cod, and walleye pollock are presented in Appendix Tables 5-7, respectively.

Three lingcod stomachs were examined at sea of which 1 was empty (Table 19). Two Pacific herring, each measuring 24 cm, were identified in the stomachs.

Seven Pacific cod were examined for stomach contents (Table 19). Pink shrimp was the dominant food item in the stomachs.

A total of 79 walleye pollock stomachs was examined at sea (Table 19); 32 were empty or everted. The principal prey (% by volume) identified in the stomachs containing food was euphausiid (59%).

OCEANOGRAPHIC SAMPLING

The STD sampling results (R. Thomson, pers. comm.) are presented by surface, 50 m and 100 m depth intervals. The following were examined: sea temperature in °C (Figs. 10-12); salinity in °/.. (Figs. 13-15); density or sigma-t (σ) (Figs. 16-18); and, current velocity (cm/sec) relative to 100 m (Figs. 19-20). Relatively warm and fresh water occurred nearshore, apparently due to outflow from the Strait of Juan de Fuca. Current vector maps indicate the existence of the Juan de Fuca eddy southwest of Finger Bank.

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Table 1. Set locations for the STD casts. F/V CALEDONIAN, August 12-25, 1986.

STD cast	Trawl set no.	Position	Date	Time(PDT)	Depth of cast (m)
1	1	48°33.40'W, 125°22.30'N	13	0852	159
2	4	48°25.60'W, 125°15.90'W	13	1710	176
3	7	48°18.00'W, 125°56.00'N	14	0930	254
4	9	48°26.80'W, 125°37.60'N	14	1330	108
5	13	48°32.50'W, 125°38.00'N	15	1530	75
6	14	48°55.10'W, 125°39.50'N	16	1100	95
7	15	49°02.80'W, 126°30.10'N	16	1720	145
8	16	49°24.20'W, 126°13.40'N	17	0850	64
9	17	49°22.40'W, 126°14.60'N	17	1145	35
10[a]		49°37.00'W, 126°35.00'N	17	1810	117
11	18	49°35.30'W, 126°36.10'N	17	2210	104
12	20	48°55.50'W, 125°46.60'N	19	1400	91
13	21	48°46.40'W, 125°34.00'N	19	1930	140
14	22	48°38.40'W, 125°38.70'N	20	1154	50
15	23	48°34.00'W, 125°38.80'N	21	0745	80
16	24	48°34.70'W, 125°04.00'N	21	1230	105
17	25	48°32.70'W, 124°47.20'N	21	1545	130
18	26	48°26.10'W, 125°20.20'N	21	2050	170
19	27	48°28.00'W, 125°19.00'N	22	0730	170
20	28	48°26.20'W, 125°20.30'N	22	1350	173
21	30	48°28.00'W, 125°17.60'N	22	1800	150
22	32	48°28.20'W, 125°18.30'N	23	0710	150
23	34	48°25.40'W, 125°20.50'N	23	1510	162
24	35	48°26.50'W, 125°31.40'N	23	1830	126
25	32	48°34.70'W, 125°39.40'N	24	1530	62
26	38	48°39.50'W, 125°27.80'N	24	1850	139
27[b]		48°49.00'W, 125°15.20'N	25	1004	108

[a] In the vicinity of Trawl set 18.
[b] Inside Barkley Sound.

Table 2. Common and scientific names of fish species captured during the F/V CALEDONIAN cruise, August 1986.

Common name	Scientific name
Pacific hake	Merluccius productus
Sablefish	Anoplopoma fimbria
Spiny dogfish	Squalus acanthias
Pacific herring	Clupea harengus pallasi
Arrowtooth flounder	Atheresthes stomias
Dover sole	Microstomus pacificus
English sole	Parophrys vetulus
Flathead sole	Hippoglossoides elassodon
Pacific halibut	Hippoglossus stenolepis
Petrale sole	Eopsetta jordani
Rex sole	Glyptocephalus zachirus
Shortraker rockfish	Sebastes aleutianus
Pacific ocean perch	Sebastes alutus
Redbanded rockfish	Sebastes babcocki
Darkblotched rockfish	Sebastes crameri
Splitnose rockfish	Sebastes diploproa
Greenstripe rockfish	Sebastes elongatus
Widow rockfish	Sebastes entomelas
Yellowtail rockfish	Sebastes flavidus
Boccacio rockfish	Sebastes paucispinis
Canary rockfish	Sebastes pinniger
Redstripe rockfish	Sebastes proriger
Yellowmouth rockfish	Sebastes reedi
Yelloweye rockfish	Sebastes ruberimus
Sharpchin rockfish	Sebastes zacentrus
Shortspine thornyhead	Sebastolobus alascanus
American shad	Alosa sapidissima
Chinook salmon	Oncorhynchus tshawytscha
Coho salmon	Oncorhynchus kisutch
Eulachon	Thaleichthys pacificus
Lingcod	Ophiodon elongatus
Northern anchovy	Engraulis mordax mordax
Pacific cod	Gadus macrocephalus
Pacific tomcod	Microgadus proximus
Pink salmon	Oncorhynchus gorbuscha
Walleye pollock	Theragra chalcogramma
Pacific electric ray	Torpedo californica
Ratfish	Hydrolagus colliei

Table 3. Summary of Pacific hake sampled. F/V CALEDONIAN, August 12-25, 1986.

Set[a] no.	Average net depth (m)	Length			Maturity	Paired otoliths	Stomachs		Remarks
		M	F	T			Examined	Collected	
1	151	1	3	4			3	1	Total catch
3	172	4	15	19			18	1	" "
4	188	5	16	21			19	2	" "
5	138	5	11	16			14	2	" "
6	188	13	17	30			23	3	" "
7	293	2	4	6			5	1	" "
9	108	66	92	158	72		46	12	Random 3 tubs
10	127	19	32	51	49		15	2	Total catch
11	194	1	16	17			11	3	" "
12	153	30	57	87			23	4	" "
14	70	67	166	233	159	159	59	11	Random 2 tubs
15	90	99	120	219			106		" "
16[b]	49	10	14	24			24		Total catch
18[b]	82	90	88	178	100	100	50		Random 4 tubs
19[b]	146	53	52	105	30	30			
20	37	28	111	139			104	22	" "
21	60	74	97	171			121	4	Random 4 tubs
25	70	75	112	187	135	136	53		" 3 tubs
26	119	75	87	162			100		" " "
27	106	54	86	140	140	140	140		" " "
28	145	80	86	166			166		Random 4 tubs
29	132	83	88	171			171		Random 3 tubs
32	95	76	96	166			166		Total catch
33	110	30	80	110			110		" "
34	141	76	91	167			167		Random 3
35	88	73	93	167			167		" "
36	59	47	130	177			177		" "
38	139	52	66	118		77	42		" "
39	37	134	130	264	104	106	160		Random 2 tubs
Total		1422	2051	3473	789	748	2260	68	

[a]Sets 1-13 are bottom trawl samples and sets 14-39 are midwater trawl samples.

[b]Sets made in inlets.

Table 4. Mean size (cm) at age of Pacific hake for each age class from Sets 14, 25, 27 and 38. F/V CALEDONIAN, August 12-25, 1986.

Age	Male			Female			Total		
(yr)	$\bar{X}$	S.D.	N	$\bar{X}$	S.D.	N	$\bar{X}$	S.D.	N
2	-	-	-	31.0	0	1	31.0	0	1
3	-	-	-	48.0	0	1	48.0	0	1
4	45.0	0	1	46.0	0	1	45.5	0.71	2
5	47.2	4.15	5	47.2	3.76	23	47.2	3.75	28
6	47.8	2.91	98	48.8	3.42	173	48.4	3.27	271
7	48.3	2.66	6	51.3	1.95	11	47.4	12.10	17
8	51.2	1.64	5	53.1	4.68	12	52.5	4.06	17
9	50.8	2.31	32	52.8	3.22	49	52.0	3.04	81
10	49.3	0.58	3	53.8	5.38	6	52.3	4.82	9
11	50.0	1.73	3	58.0	0	1	52.0	4.24	4
12	52.3	2.89	3	51.8	3.50	4	52.0	3.00	7
13	51.6	3.15	7	54.7	1.53	3	52.5	3.06	10
14	53.0	2.83	2	51.0	0	1	52.3	2.31	3
15	53.0	0	1	53.0	0	2	53.0	0	3
16	-	-	-	55.4	4.34	5	55.4	4.34	5
17	-	-	-	63.0	9.90	2	63.0	9.90	2
Total			166			295			461

Table 5. Pacific hake maturity frequency. F/V CALEDONIAN, August 12-25, 1986.

SET NO.	9			10			14			18[a]		
GONAD MATURITY STAGE	M	F	T	M	F	T	M	F	T	M	F	T
I2	–	–	–	–	–	–	–	–	–	1	2	3
R1	24	13	37	15	9	24	31	35	66	48	42	90
R2	0	0	0	0	0	0	2	0	2	–	0	0
R	0	0	0	0	0	0	0	0	0	–	0	0
1R	0	0	0	0	0	0	0	0	0	–	0	0
2R	0	0	0	0	0	0	0	0	0	–	0	0
RR	0	0	0	0	0	0	0	0	0	–	0	0
S	0	0	0	0	0	0	0	0	0	–	0	0
Rb	0	0	0	0	0	0	0	0	0	–	0	0
Rc	0	0	0	0	0	0	0	2	2	–	0	0
Rt	7	28	35	3	22	25	10	79	89	–	7	7
TOTAL	31	41	72	18	31	49	43	116	159	49	51	100

SET NO.	19[a]			25			27			39[a]		
GONAD MATURITY STAGE	M	F	T	M	F	T	M	F	T	M	F	T
I2	13	15	28	–	–	–	–	–	–	4	6	10
R1	–	1	1	35	12	47	43	21	64	42	41	83
R2	–	0	0	1	0	1	0	0	0	0	2	2
R	–	0	0	0	0	0	0	0	0	0	0	0
1R	–	0	0	0	0	0	0	0	0	0	0	0
2R	–	0	0	0	0	0	0	0	0	0	0	0
RR	–	0	0	0	0	0	0	0	0	0	0	0
S	–	0	0	0	0	0	0	0	0	0	0	0
Rb	–	0	0	0	0	0	0	0	0	0	0	0
Rc	–	0	0	0	0	0	0	1	1	0	0	0
Rt	–	1	1	14	73	87	11	64	75	1	8	9
TOTAL	13	17	30	50	85	135	54	86	140	47	57	104

SET NO.	TOTAL		
GONAD MATURITY STAGE	M	F	T
I2	18	23	41
R1	238	174	412
R2	3	2	5
R	0	0	0
1R	0	0	0
2R	0	0	0
RR	0	0	0
S	0	0	0
Rb	0	0	0
Rc	0	3	3
Rt	46	282	328
TOTAL	305	484	789

[a]Sets made in inlets.

Table 6. Pacific hake stomach contents by size category of hake from OFFSHORE AREAS located north and south of 49°00' latitude off Vancouver Island, August 1986.

OFFSHORE AREA	Size category (cm) 30-39	40-49	50-59	60-69	70-79	Total
North						
Stomachs examined	-	81	25	-	-	106
Stomachs everted	-	4	4	-	-	8
Stomachs empty	-	50	17	-	-	67
Stomach with contents	-	27	4	-	-	31
Diet-volume (cc)						
Eulachon	-	10	-	-	-	10 (1)[a]
Euphausiid	-	138	21	-	-	159 (31)
Total (cc)	-	148	21	-	-	169 cc
South						
Stomachs examined	7	1259	669	38	1	1974
Stomachs everted	0	169	92	9	0	270
Stomachs empty	3	304	150	9	0	466
Stomachs with contents	4	786	427	20	1	1238
Diet-volume (cc)						
Pacific herring		191 (8)	757 (24)	25 (1)	401 (1)	1374 (34)
Northern smooth tongue			155			155 (10)
Salmonidae					92	92 (1)
Eulachon		20	4			24 (2)
Myctophidae			2			2 (1)
Fish remains (unid.)		21	204	277		502 (2)
Unid. remains		5	28	3		36 (9)
Euphausiid	26	5895	4860	203		10984(1171)
Euph. (E. pacifica)		25				25 (9)
Euph. (T. spinifera)	8	48	140	10		206 (21)
Pink shrimp		358	363	29		750 (85)
Shrimp (sp.)		2	6			8 (2)
Squid (sp.)		5				5 (1)
Nematode (sp.)			T[b]			T (1)
Total (cc)	34	6570	6519	547	493	14163 cc

[a]Frequency of hake stomachs in brackets.
[b]T=Trace, less than 1 cc.

Table 7. Length frequency of Pacific herring identified in the stomachs of Pacific hake. F/V CALEDONIAN, August 12-25, 1986.

Standard length (cm)	Set no. 9	11	16[a]	20	21	25	26	27	28	35	36	38	Total
8			5								2		7
9													0
10											1		1
11													0
12		1									3		4
13										1			1
14	1							1		1	2	1	6
15										1	1		2
16				1						1			2
17				1									1
18					1				1		1		3
19						1							1
20		1								1			2
21							1						1
Total	1	2	5	2	1	1	1	1	1	5	10	1	31

[a]Midwater set made in inshore waters.

Table 8. Pacific hake stomach contents by size category of hake from INSHORE AREAS located north and south of 49°00' latitude, along Vancouver Island, August 1986.

INSHORE AREA	Size category (cm) 30-39	40-49	50-59	60-69	70-79	Total
North						
Stomachs examined	26	42	5	1	1	75
Stomachs everted	8	13	0	-	-	21
Stomachs empty	15	22	1	1	-	39
Stomachs with contents	3	7	4	0	1	15
Diet-volume (cc)						
Pacific herring	-	-	20 (1)[a]	-	-	20[b] (1)[b]
Pacific tomcod	-	-	-	-	62	62 (1)
Northern anchovy	-	-	32	-	-	32 (1)
Fish remains (unid.)	6	11	17	-	44	78 (8)
Unid. remains	1	-	-	-	-	1 (1)
Euphausiid	-	7	-	-	-	7 (4)
Total (cc)	7	18	89		106	200 cc
South						
Stomachs examined	143	15	2	-	-	160
Stomachs everted	22	3	0	-	-	25
Stomachs empty	30	1	2	-	-	33
Stomach with contents	91	11	0	-	-	102
Diet-volume (cc)						
Northern smooth tongue	10	-	-	-	-	10 (1)
Euphausiid	349	32	-	-	-	381(100)
Pink shrimp	-	7	-	-	-	7 (1)
Total (cc)	359	39				398 cc

[a]5 herring found in 1 hake stomach (set 16).
[b]Frequency of hake stomachs in brackets.

Table 9. Parasite content identified in the flesh of hake caught in Tahsis Inlet and Trevor Channel in August, 1986. (K.T. = Kudoa thyrsites, K.P. = Kudoa paniformes, -ve = no parasite).

Fork length (cm)	Trevor Channel August 1986 KT	KP	-ve	Fork length (cm)	Tahsis Inlet August 1986 KT	KP	-ve
				18			1
				19			3
32	1			20	1		2
33			2	21			3
34				22	1		2
35	2			23	1		
36				24			
37				25	1		
38	1			26	1		
39				>			
40				32			1
41				>			
42				36			1
43				37	1		
46				38			1
47	1			>			
>				47	1		
56	1						
>							
58		1					
Total	6	1	2	Total	7	0	14

Table 10. Summary of sablefish sampled. F/V CALEDONIAN, August 12-25, 1986.

Set no.	Average net depth (m)	Length			Stomachs		Remarks
		M	F	T	Examined	Preserved	
1	151	20	9	29	20	8	Total catch
3	172	25	14	39	20	19	" "
4	188	5	4	9	7	2	" "
5	138	10	10	20	16	4	" "
6	188	3	1	4	4		" "
7	293	2	1	3	3		" "
8	155	8	1	9	8	1	" "
9	108	12	2	14	12	2	" "
10	127	1	2	3	3		" "
11	194	7	8	15	9	6	" "
12	153	9	21	30	17	13	" "
13	78	30	15	45	20	20	Random 1 tub
13[a]	78	81	45	126	110	16	Selected 2 tubs
Total		213	133	346	249	91	

[a]Lengths not used in the length frequency.

Table 11. Sablefish stomach contents by size category of sablefish from OFFSHORE AREAS located south of 49°00' latitude, off Vancouver Island, August 1986.

	Size category (cm)						
OFFSHORE AREA	30-39	40-49	50-59	60-69	70-79	80-89	Total
South							
Stomachs examined	62	116	58	76	23	5	340
Stomachs everted	0	0	0	0	1	0	1
Stomachs empty	2	15	9	10	4	1	41
Stomachs with contents	60	101	49	66	18	4	298
Diet-volume (cc)							
Pacific herring	-	-	40(1)	-	100	-	140 (2)[a]
Pacific hake	-	-	100	1660	100	30	1890(13)
Pacific hake heads only	-	-	-	80	60	-	140 (2)
Turbot	-	-	-	8	-	-	8 (1)
Scorpaenidae	-	-	-	-	332	-	332 (1)
Scorpaenidae heads only	-	-	-	300	-	-	300 (1)
Walleye pollock	-	-	-	8	-	-	8 (1)
Lingcod	-	-	804	2064	1066	370	4304(19)
Pacific sand lance	5	18	9	-	-	-	32 (2)
Spiny dogfish	-	-	-	30	-	-	30 (1)
Selachii remains	-	-	-	-	118	-	118 (1)
Eulachon	-	5	-	-	-	-	5 (1)
Pacific sardine	5	21	8	-	-	-	34 (3)
Fish remains (unid.)	-	98	1075	2338	689	342	4542(40)
Unid. remains	4	10	1	110	8	73	206 (6)

Table 11 (cont'd)

OFFSHORE AREA	Size category (cm) 30-39	40-49	50-59	60-69	70-79	80-89	Total
Euphausiid	1275	2426	505	251	12	-	4469(191)
Pink shrimp	-	11	25	5	5	-	46 (4)
Shrimp (sp.)	-	1	-	-	-	-	1 (1)
Amphipod	-	-	-	T[b]	-	-	T (1)
Mollusc	-	-	-	385	-	-	385 (1)
Snail (sp.)	-	-	-	1	-	-	1 (1)
Sponge	-	-	-	40	-	-	40 (1)
Peanut worm (sipunculid)	-	-	10	6	-	-	16 (1)
Jellyfish	-	20	-	-	-	-	20 (1)
Polycheate	4	-	-	-	-	-	4 (1)
Euph. (T. spinifera)	9	13	2	-	-	-	24 (6)
Turkey feet	-	-	-	100	-	-	100 (1)
Total (cc)	1302	2623	2579	7386	2480	815	17195 cc

[a]Frequency of occurrence in sablefish stomachs.

Table 12. Summary of spiny dogfish sampled. F/V CALEDONIAN, August 12-25 1986.

Set no.	Average net depth (m)	Length			Stomachs		Remarks
		M	F	T	Examined	Preserved	
1	151	21	31	52	45	3	Total catch
2	100	35	52	87	84	3	" "
3	172	32	32	64	50	13	" "
5	138	9	11	20	19	1	" "
9	108	5	1	6	1	0	" "
11	194	5	2	7	6	1	" "
13[a]		16	12	28	16	3	Selected 1 tub
16[b]	49	7	14	21	20	1	Total catch
17[b]	27	0	18	18	13	6	" "
22	23	49	21	70	67	4	Random 4 tubs
23	46	56	20	76	75	1	Total catch
24	55	28	4	32	32		" "
25		13	7	20	20		Random 1 tub
28	178	13	17	30	30		Total catch
30	169	16	13	29	29		" "
31	163	20	5	25	25		" "
32	169	18	16	34	34		" "
33	173	16	26	42	42		" "
34	162	21	12	33	33		" "
35	126	13	5	18	17	1	" "
37	42	41	46	87	60		" "
Total		434	365	799	718	36	

[a]Lengths not used in the length frequency.
[b]Sets made in inlets.

Table 13. Spiny dogfish stomach contents by size category of dogfish from OFFSHORE AREAS located south of 49°00' latitude off Vancouver Island, August 1986.

	Size category (cm)			
OFFSHORE AREA	<60	60-80	>80	Total
South				
Stomachs examined	134	450	130	714
Stomachs empty	70	217	55	342
Stomachs with contents	64	233	75	372
Diet-volume (cc)				
Pacific herring	8(1)	445(7)	1024(16)	1477 (24)[a]
Eulachon	-	545	780	1325 (24)
Pacific hake	105	769	320	1194 (27)
Pacific hake heads(only)	-	20	190	210 (3)
Salmonidae	-	4	2	6 (2)
Myctophidae	63	193	-	256 (48)
Lingcod	-	-	106	106 (1)
Fish remains (unid.)	90	731	651	1472 (55)
Unid. remains	8	31	5	44 (13)
Euphausiid	183	2270	615	3068(242)
Euph. (T. spinifera)	17	97	17	131 (7)
Euph. (E. pacifica)	98	260	111	469 (6)
Pink shrimp	3	2	7	12 (4)
Mollusc sp.	-	1	1	1 (1)
Crab sp.	-	T[b]	-	1 (2)
Unid. crustacea	-	-	1	T (1)
Octopus	30	17	T	47 (2)
Squid sp.	-	20	-	20 (1)
Unid. cephlapod	-	5	-	5 (1)
polycheate	-	1	-	1 (1)
peanut worm (sipinculid)	5	-	-	5 (1)
Total (cc)	610	5411	3829	9850 cc

[a]Frequency of dogfish stomachs in brackets.
[b]T=Trace, less than 1 cc.

Table 14. Length frequency of Pacific herring identified in the stomachs of spiny dogfish. F/V CALEDONIAN, August 12-25, 1986.

Standard length (cm)	Set no.					Total
	17	22	23	24	34	
12			1			1
13	2			2		4
14	1			2	1	4
15	1			6		7
16				1		1
17				1		1
18				1		1
19						0
20		1		1		2
21						0
22				1		1
23						0
24						0
25			2			2
Total	4	1	3	15	1	24

Table 15. Spiny dogfish stomach contents by size category of dogfish from INSHORE AREAS located north of 49°00' latitude along Vancouver Island, August 1986.

	Size category (cm)			
INSHORE AREA	<60	60-80	>80	Total
North				
Stomachs examined	10	5	25	40
Stomachs empty	4	3	8	15
Stomach with contents	6	2	17	25
Diet-volume (cc)				
Pacific herring	20(1)	30(1)	111(4)	161 (6)[a]
Eulachon	-	-	1115	1115(11)
Pacific hake	-	-	65	65 (2)
Anchovy	-	-	37	37 (1)
Fish remains (unid.)	1	-	50	51 (2)
Unid. remains	-	-	44	44 (3)
Euphausiid	5	2	-	7 (5)
Total (cc)	26	32	1422	1480 cc

[a]Frequency of dogfish stomachs in brackets.

Table 16. Length frequency distribution of herring by set, August 12-25, 1986. All fish collected by mid-water trawl.

Standard length (cm)	Shelter Inlet	Sydney Inlet	Firing Range		40-mile Bank		Swiftsure Bank
	16	17	20	36	23	37	24
9.1-9.5		1					
9.6-10.0							
10.1-10.5							
10.6-11.0		5					
11.1-11.5		6					
11.6-12.0	2	9					
12.1-12.5	2	17				1	3
12.6-13.0	2	29	7				15
13.1-13.5	2	12	7	1		5	48
13.6-14.0	2	12	8	2		29	46
14.1-14.5		2	8	6		45	71
14.6-15.0		2	8	4		66	27
15.1-15.5		2	8			63	10
15.6-16.0		1	1	1	1	52	1
16.1-16.5			1	2		35	3
16.6-17.0						24	1
17.1-17.5						5	2
17.6-18.0		1			1	6	2
18.1-18.5				1		6	1
18.6-19.0		1				7	2
19.1-19.5				1	4	9	1
19.6-20.0					8	11	
20.1-20.5					10	8	
20.6-21.0					27	4	1
21.1-21.5					31	1	1
21.6-22.0					26		
22.1-22.5					20		
22.6-23.0					13		
23.1-23.5					6		
23.6-24.0					14		
24.0+					1	1	
Total	10	100	48	18	162	378	235

Table 17. Herring age composition, mean standard length (cm), and mean total weight-at-age. Weights and ages not determined for herring caught during sets 36 and 37.

Location	Set no.	Age 1+	2+	3+	4+	5+	6+	Unknown
Shelter Inlet	16							
No. fish		8						2
% at age		100						-
$\bar{x}$ length		11.6						11.6
$S\bar{x}$ length		0.40						0.50
$\bar{x}$ weight		25.9						19.5
$S\bar{x}$		2.18						0.50
Sydney Inlet	17							
No. fish		50	3					47
% at age		94.3	5.7					-
$\bar{x}$ length		12.76	16.8					12.66
$S\bar{x}$ length		0.140	1.53					0.160
$\bar{x}$ weight		26.9	55					26.1
$S\bar{x}$ weight		0.84	13.3					1.02
Firing Range	20							
No. fish		6						8
% at age		100						-
$\bar{x}$ length		14.13						13.92
$S\bar{x}$ length		0.280						0.264
$\bar{x}$ weight		35.3						34.6
$S\bar{x}$ weight		2.25						1.79
Firing Range	36							
No. fish								18
$\bar{x}$ length								15.1
$S\bar{x}$ length								0.36
40 Mile Bank	23							
No. fish			2	9	6	1	1	40
% at age			10.5	47.4	31.6	5.3	5.3	-
$\bar{x}$ length			18.4	20.04	20.46	22.7	23.0	21.43
$S\bar{x}$ length			0.50	0.208	0.233	-	-	0.200
$\bar{x}$ weight			97	128	133	186.0	172.0	120
$S\bar{x}$ weight			4.0	4.5	7.5	-	-	33
40 Mile Bank	37							
No. fish								20
$\bar{x}$ length								15.1
$S\bar{x}$ length								0.36

Table 18. Summary of other species sampled. F/V CALEDONIAN, August 12-25, 1986.

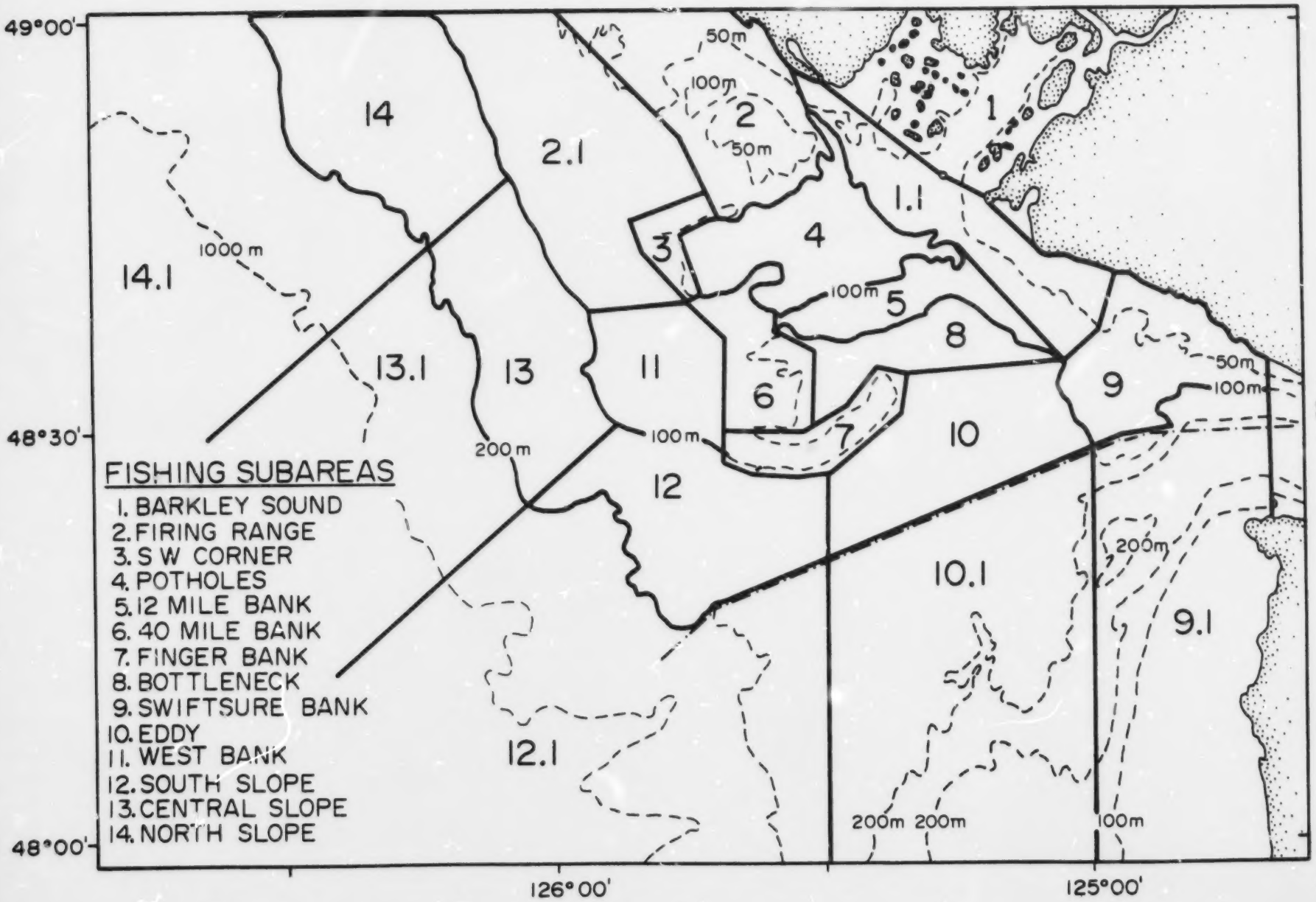
Set no.	Average net depth (m)	Length			Stomachs		Remarks
		M	F	T	Examined	Preserved	
				Lingcod			
3	172	0	1	1			Total catch
13	78	1	0	1	1		" "
20	81	0	2	2	2		" "
Total		1	3	4	3	-	
				Pacific cod			
1	151	2	4	6			Total catch
3	172	3	1	4			" "
5	138	3	4	7	7		" "
Total		8	9	17	7		
				Walleye pollock			
1	151	28	35	63			Total catch
4	188	9	20	29			" "
5	138	60	76	136			" "
11	194	46	187	233	79	3	" "
Total		143	318	461	79	3	

Table 19. Other species sampled stomach contents. F/V CALEDONIAN, August 12-25, 1986.

Lingcod		
Number examined	3	
Number empty	1	
Diet-volume (cc)	(cc)	
Pacific herring	180	(2)[a]
Fish remains (unid.)	40	
Total	220	
Pacific cod		
Number examined	7	
Number empty	3	
Diet-volume (cc)	(cc)	
Pink shrimp	18	
Euphausiid	1	
Total	19	
Walleye pollock		
Number examined	79	
Number empty	30	
Number everted	2	
Diet-volume (cc)	(cc)	
Euphausiid	169	
Amphipod	8	
Pink shrimp	104	
Fish remains (unid.)	5	
Unid. remains	1	
Total	287	

[a]Both herring measured 24 cm.

Fig. 1. La Pérouse Project fishing subareas.


49°00'
48°30'
48°00'
126°00'
125°00'
50m
100m
200m
1000 m
1
2
2.1
14
14.1
1.1
3
4
5
8
9
13.1
13
11
6
7
10
12
12.1
10.1
9.1
FISHING SUBAREAS
1. BARKLEY SOUND
2. FIRING RANGE
3. S W CORNER
4. POTHOLES
5. 12 MILE BANK
6. 40 MILE BANK
7. FINGER BANK
8. BOTTLENECK
9. SWIFTSURE BANK
10. EDDY
11. WEST BANK
12. SOUTH SLOPE
13. CENTRAL SLOPE
14. NORTH SLOPE

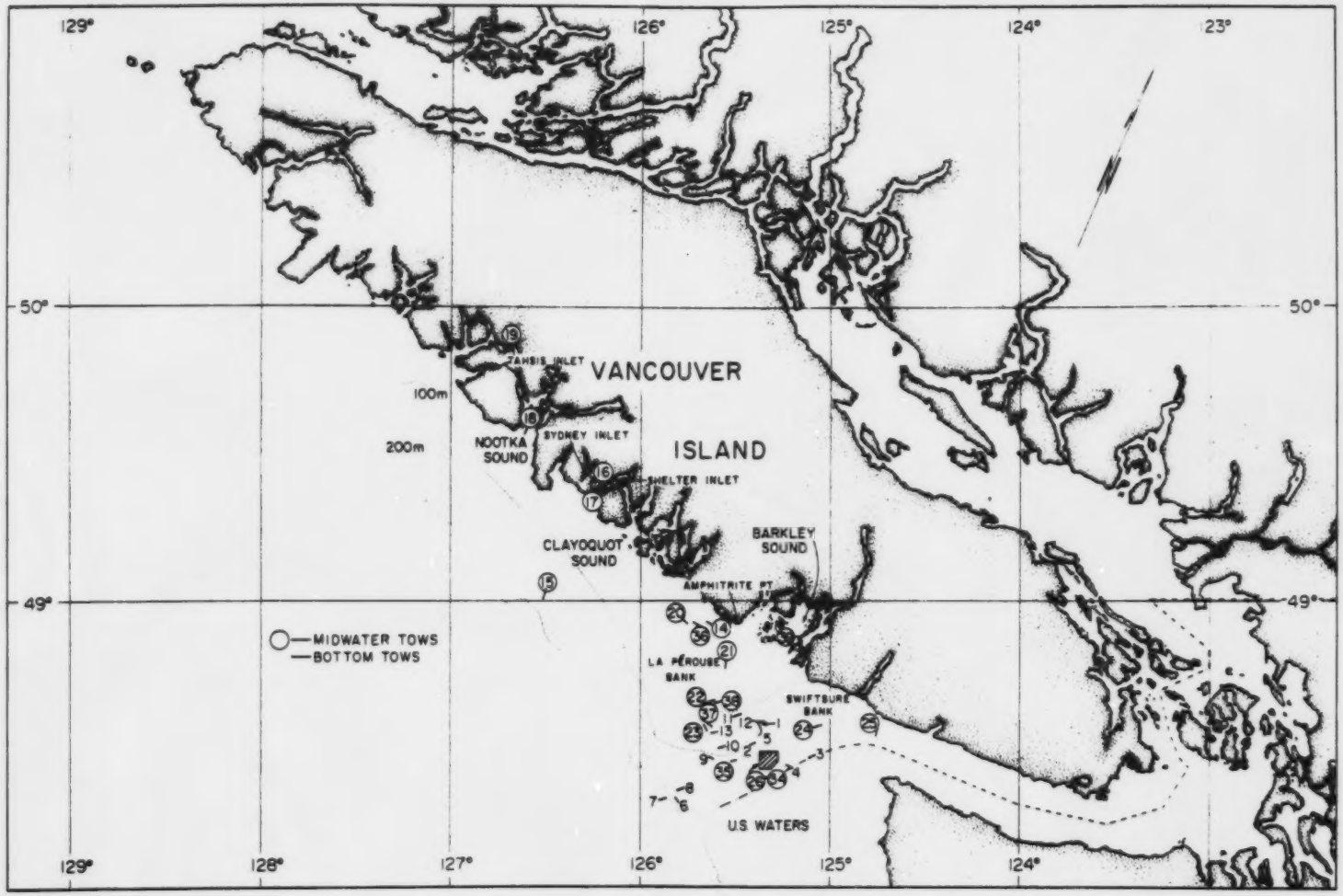


Fig. 2. Trawl positions occupied by the F/V CALEDONIAN, August 12-25, 1986.

Fig. 3. Density distribution of Pacific hake August 1986, as estimated from the catch rates. The contour intervals are in units of 20 hake/10000 M^3. The highest observed density was 562 hake/10000 M^3. The left-hand boundary of the survey area is the 200 M isobath, top = 49° N. lat., bottom = 48° N lat., right top = Barkley Sound, right bottom = 200 M isobath. The 100 M isobath is also shown.

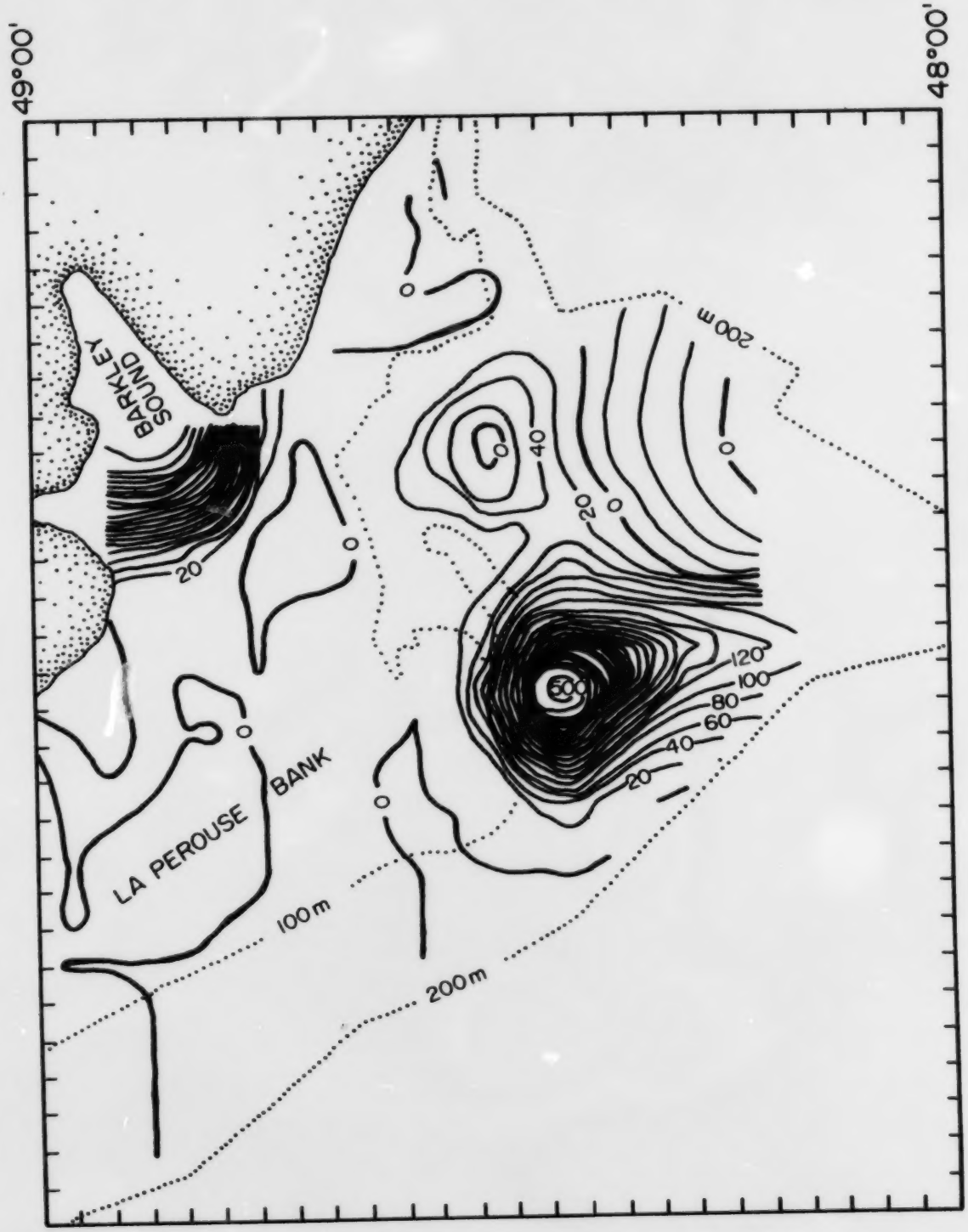

49°00'
48°00'
BARKLEY SOUND
LA PEROUSE BANK
100m
200m
200m
0
20
40
60
80
100
120
500

Fig. 3.

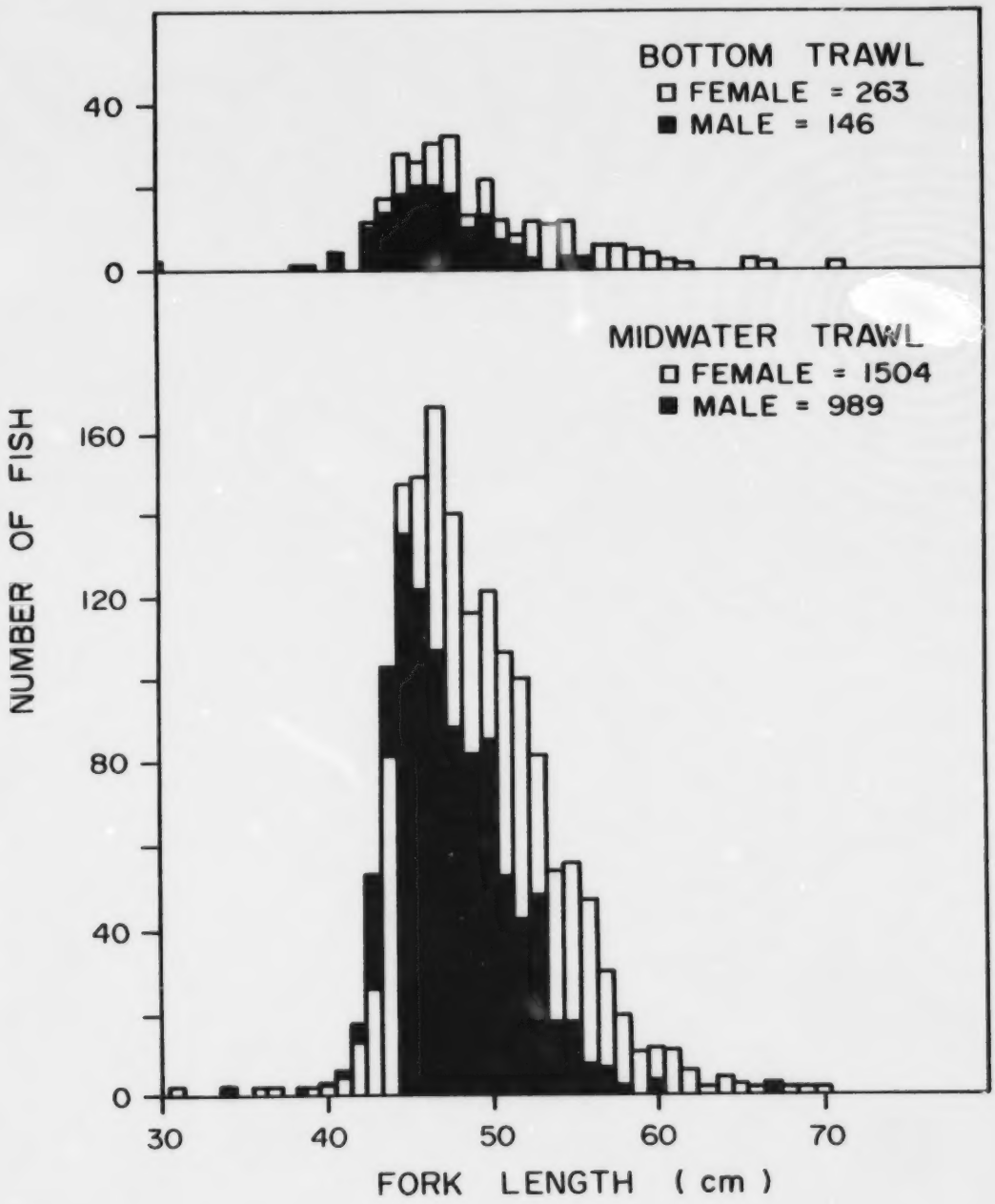


Fig. 4. Length frequency of Pacific hake caught in midwater and bottom tows from offshore waters. F/V CALEDONIAN, August 12-25, 1986.

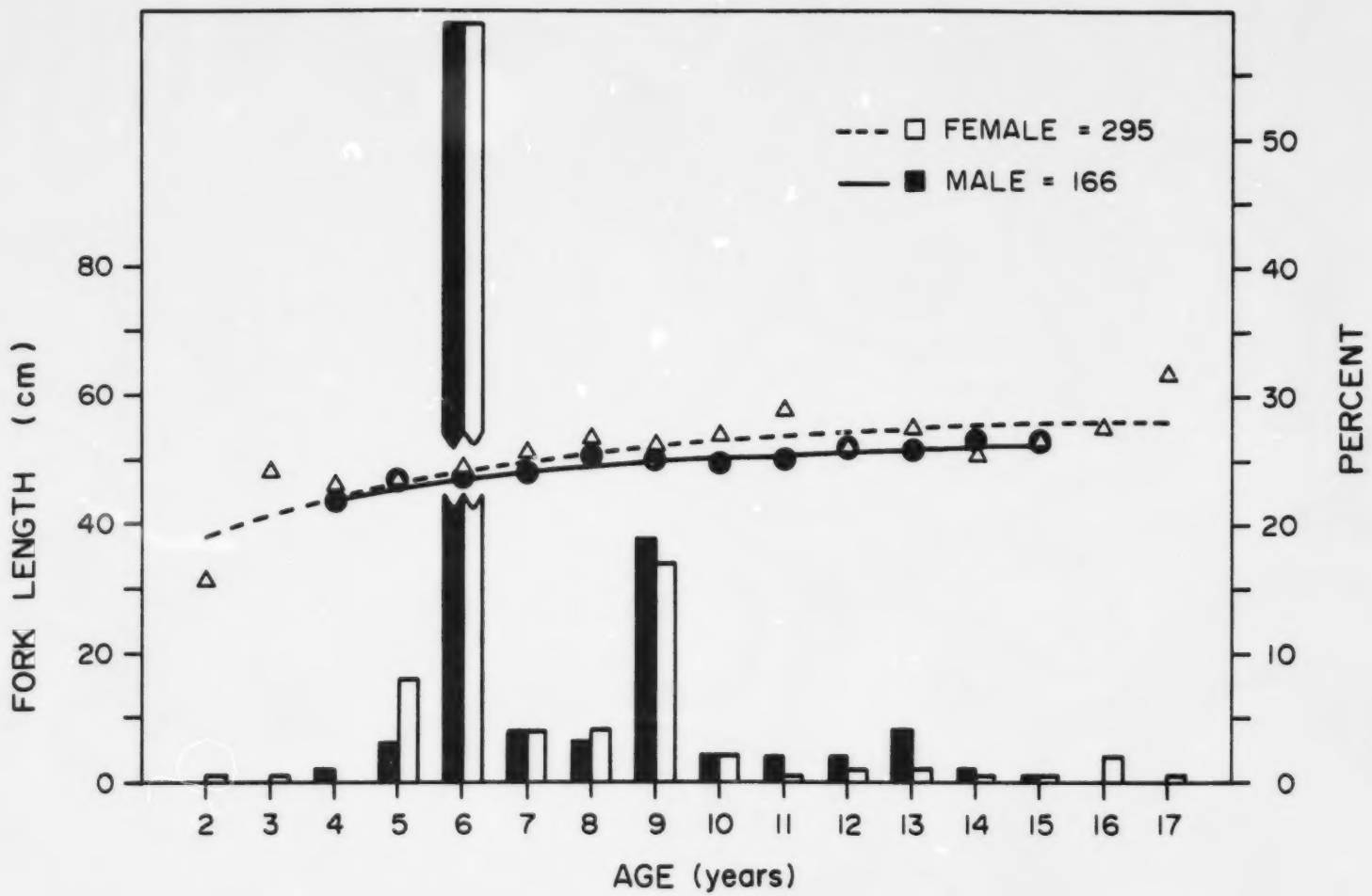


Fig. 5. Age frequency and mean length at age plots by sex of Pacific hake caught in midwater tows from offshore waters. F/V CALEDONIAN, August 12-25, 1986. (Curves fitted using the von Bertalanffy equation.)

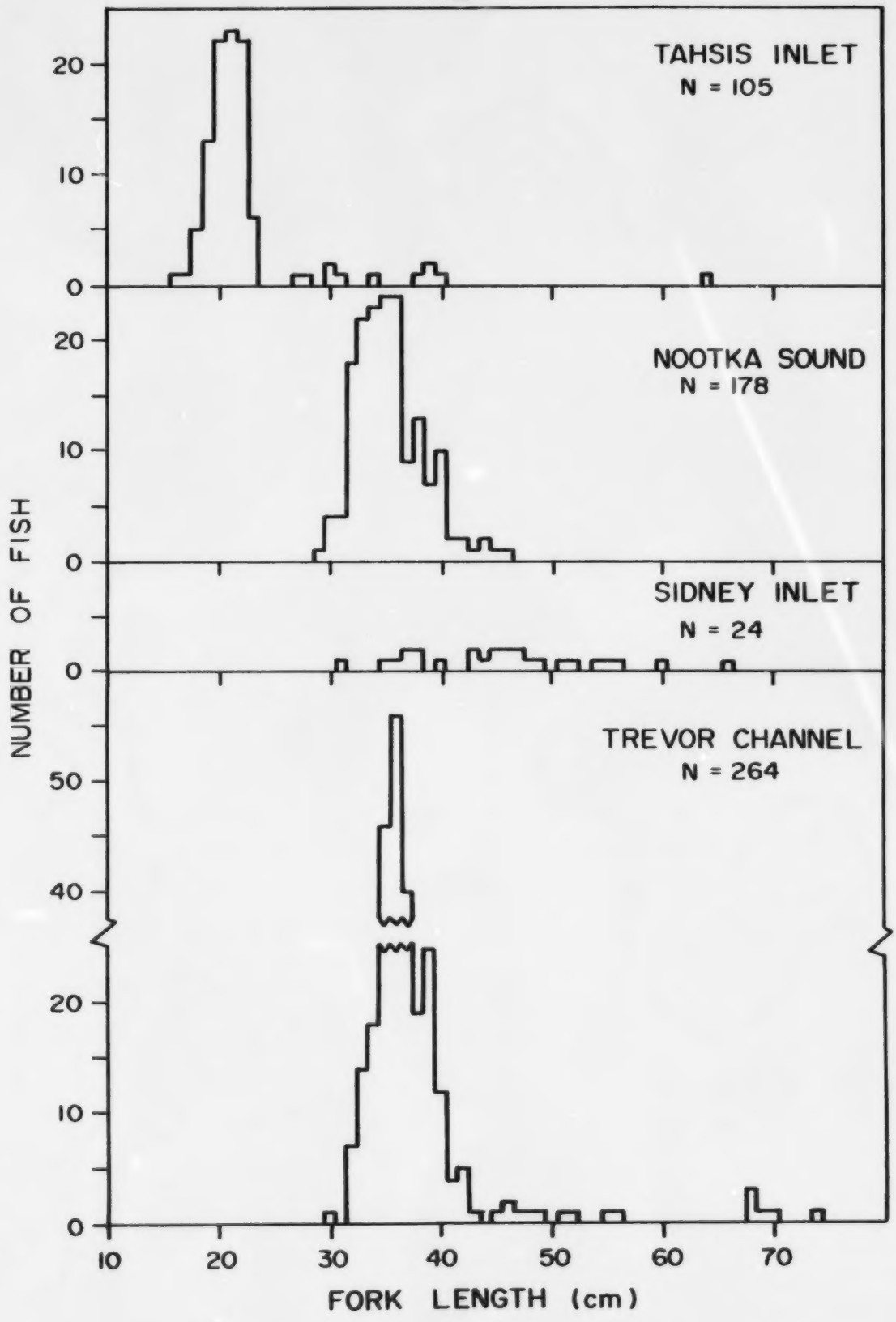


Fig. 6. Length frequency of Pacific hake caught in midwater tows in the inlets. F/V CALEDONIAN, August 12-25, 1986.

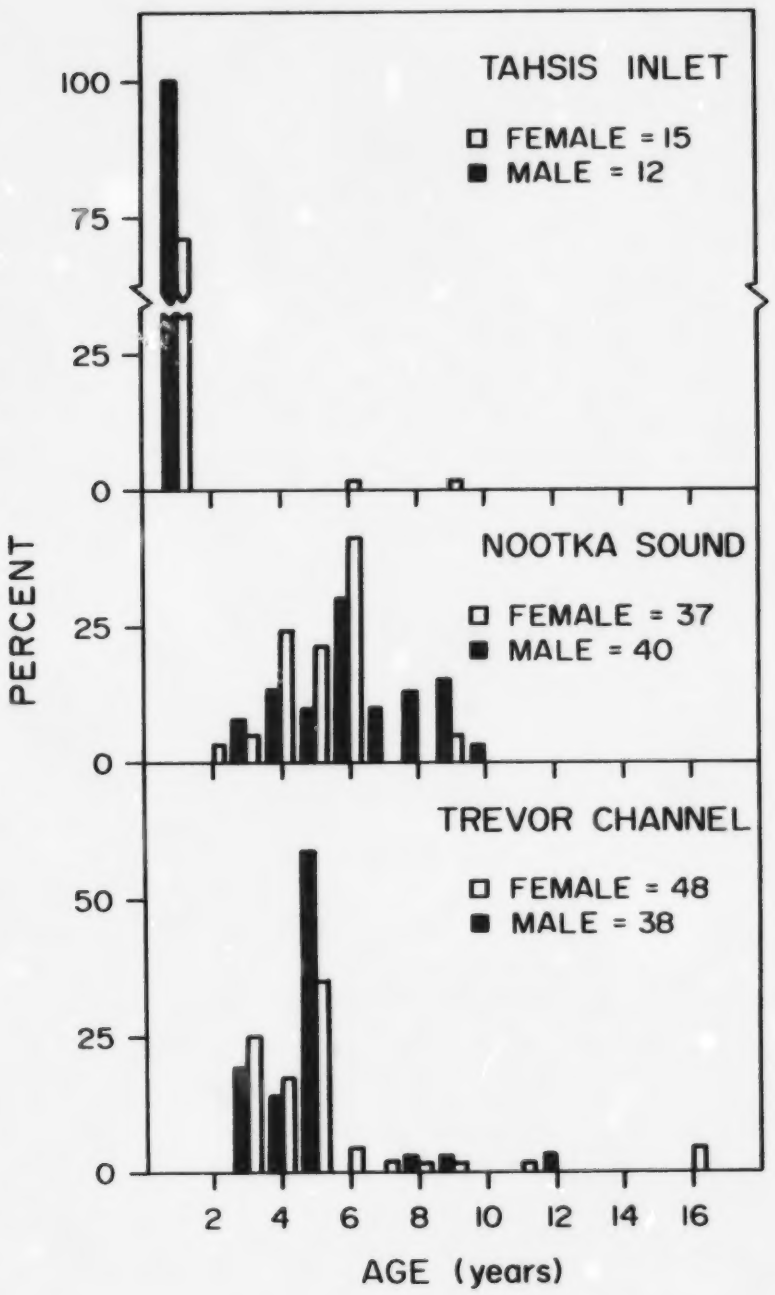


Fig. 7. Age frequency by sex of Pacific hake caught in midwater tows in the inlets. F/V CALEDONIAN, August 12-25, 1986.

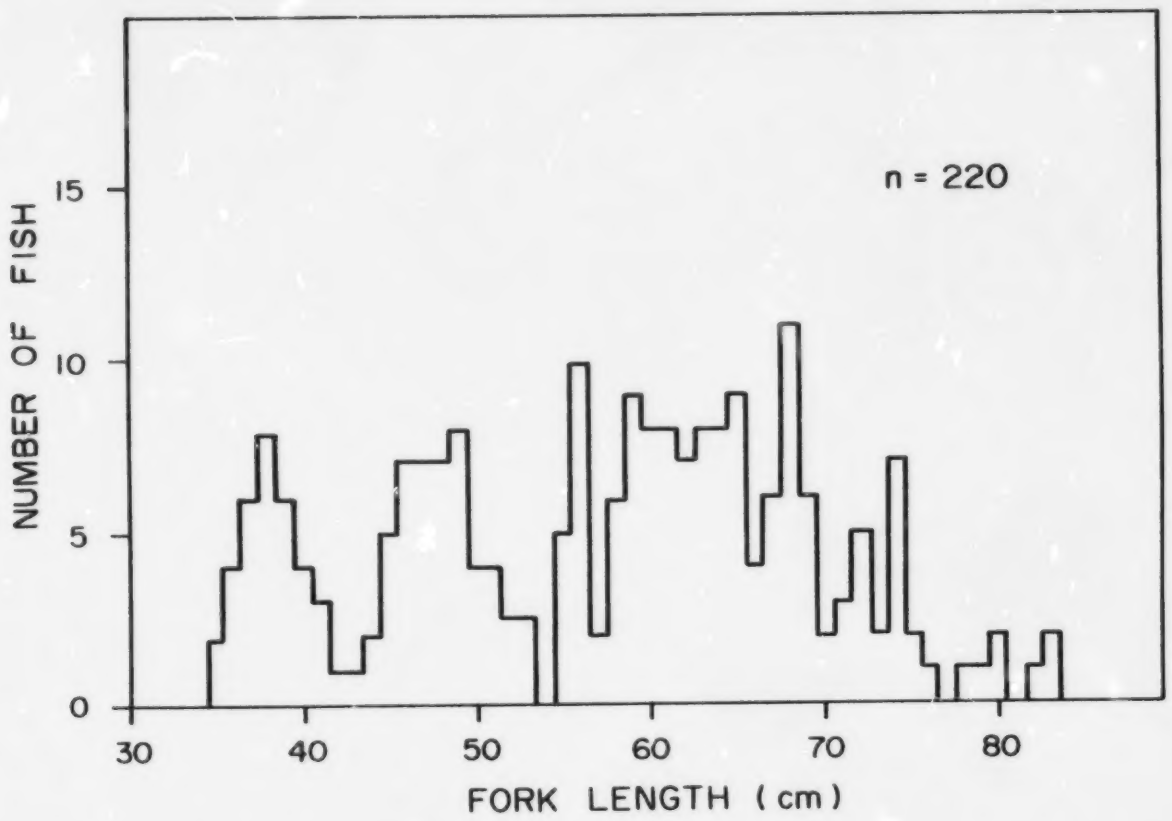


Fig. 8. Sablefish length frequency. F/V CALEDONIAN, August 12-25, 1986.

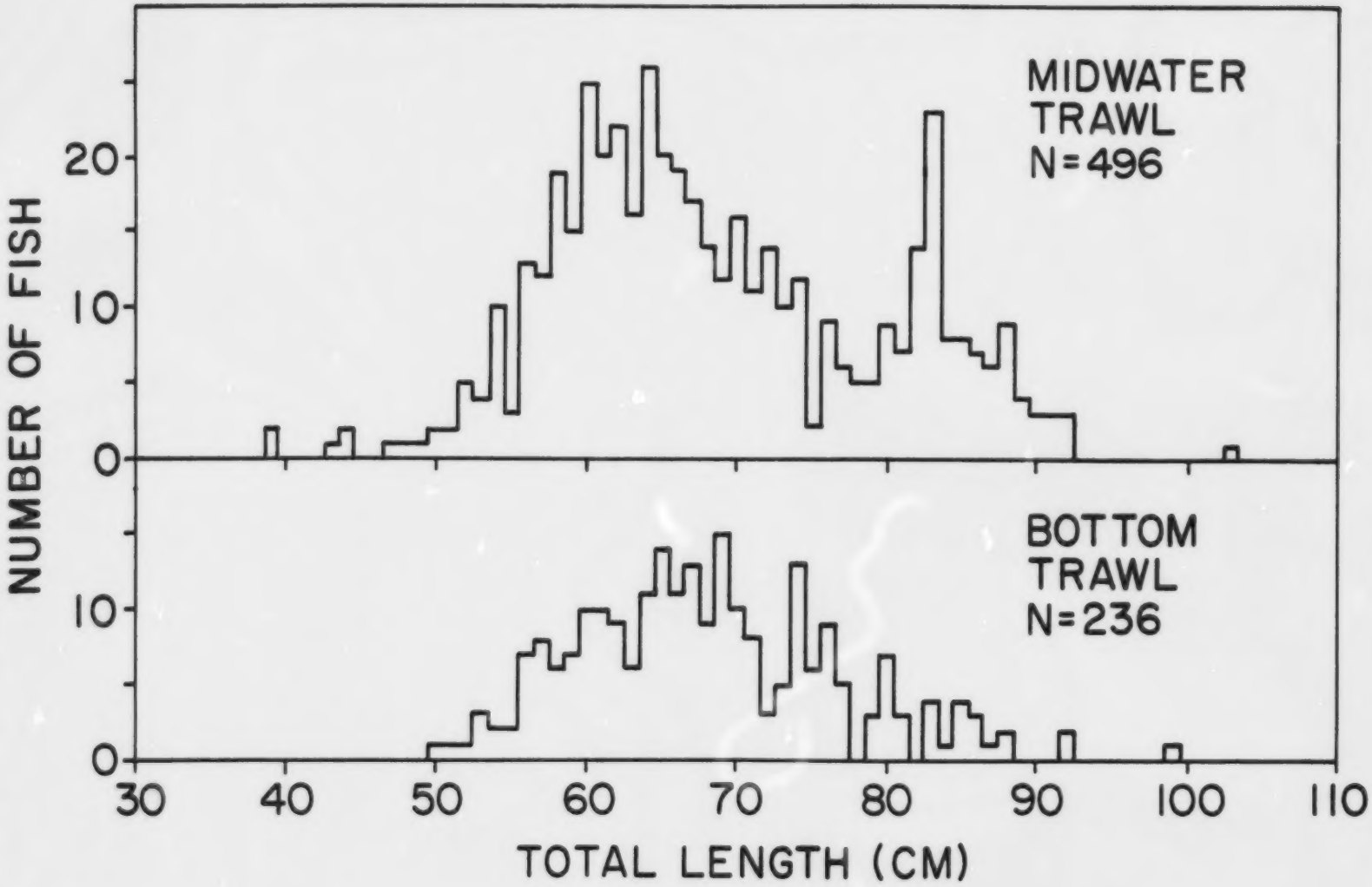


Fig. 9. Spiny dogfish length frequency from midwater and bottom tows. F/V CALEDONIAN, August 12-25, 1986.

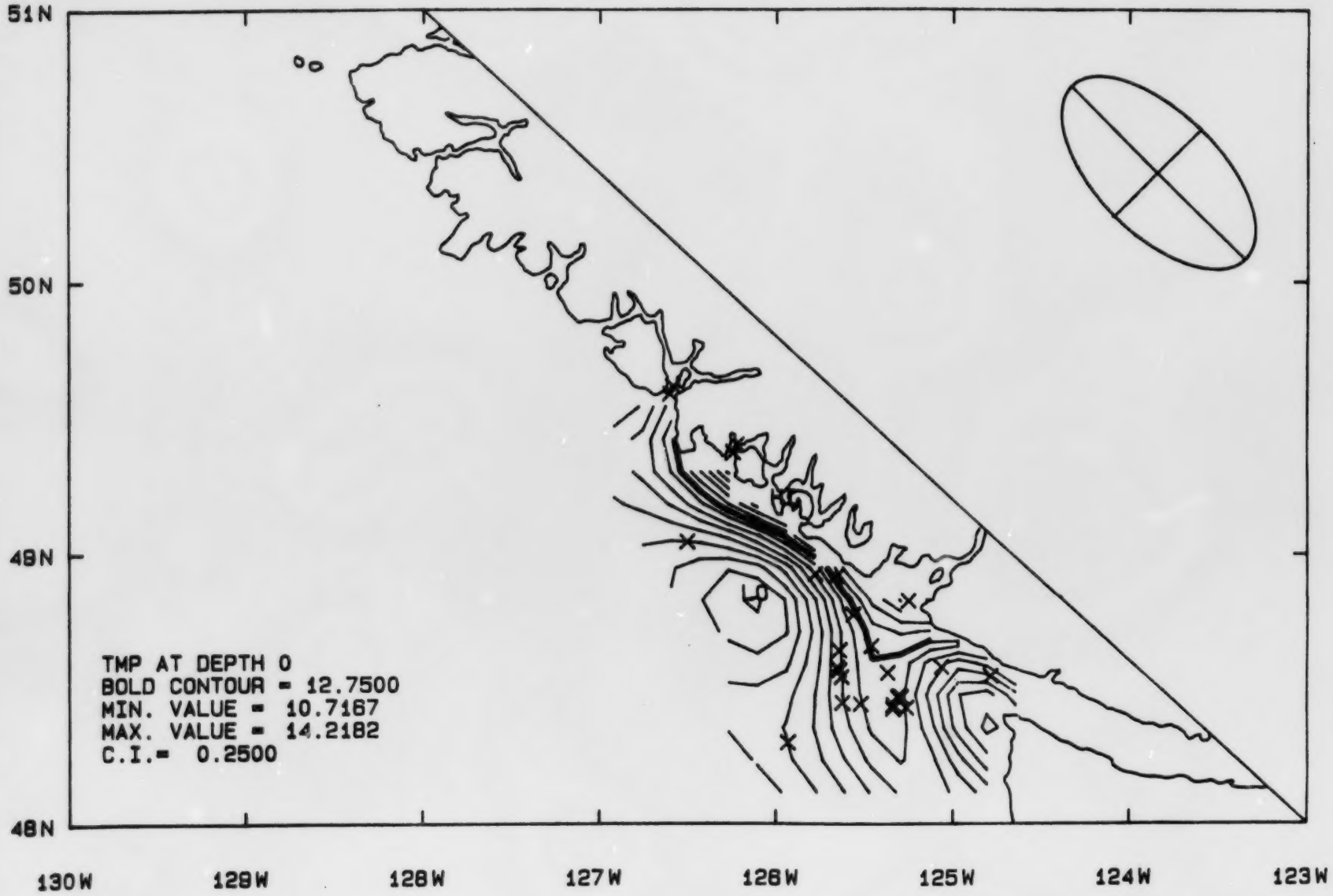


Fig. 10. Sea surface temperature (°C) profiles, August 12-25, 1986. (+ represents STD station).

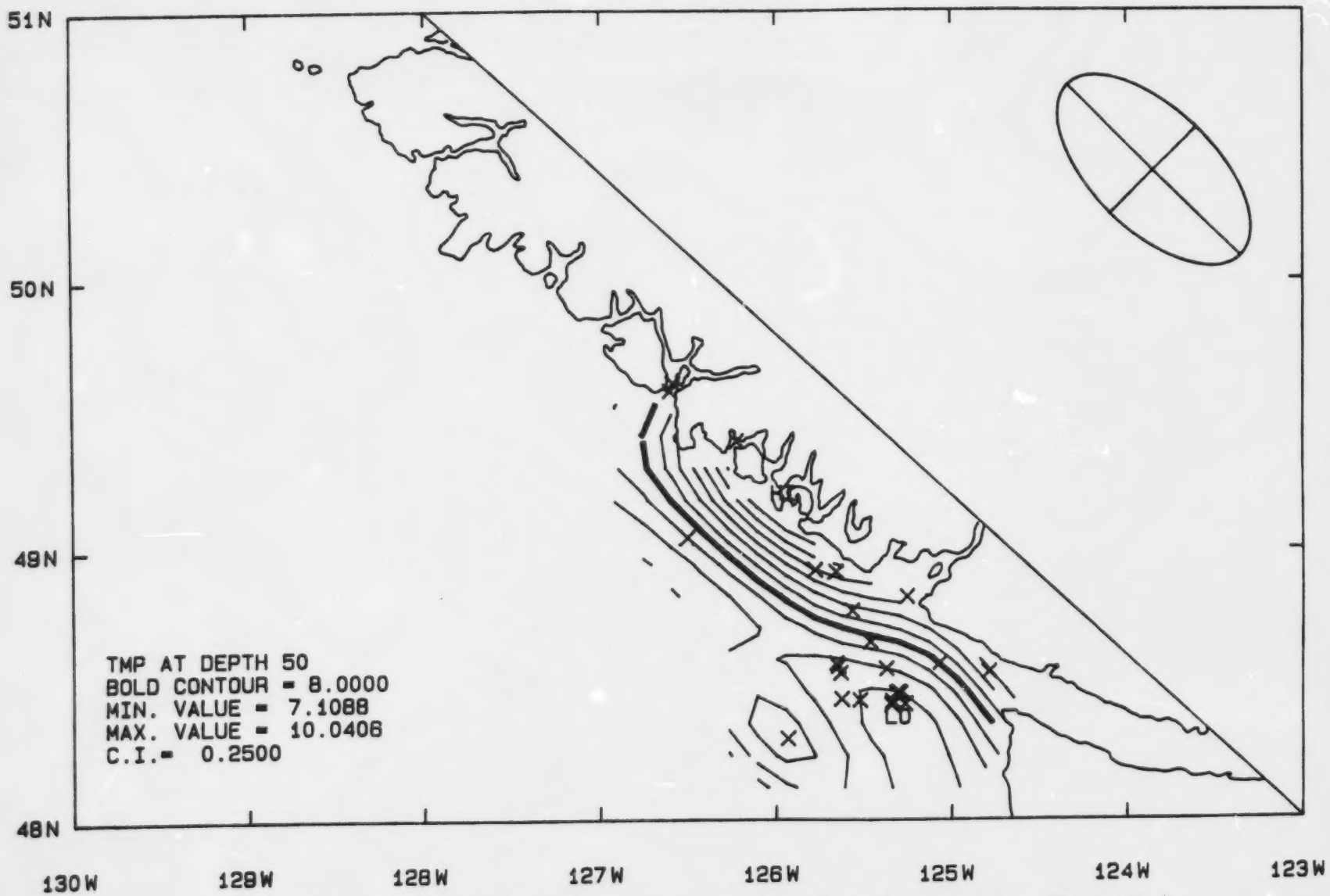


Fig. 11. Sea temperature (°C) profiles at 50 m depth, August 12-25, 1986. (+ represents STD station).

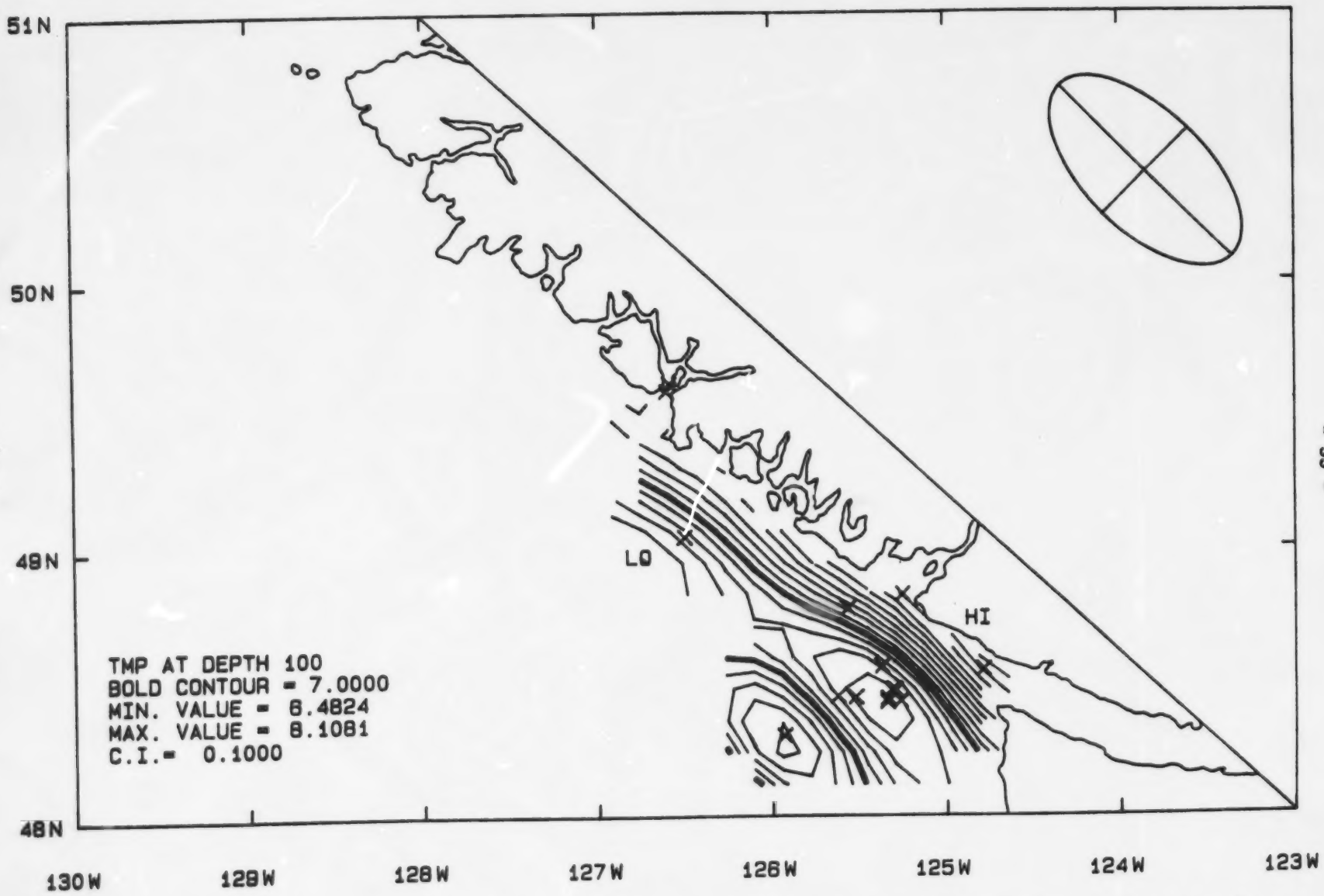


Fig. 12. Sea temperature (°C) profiles at 100 m depth, August 12-25, 1986. (+ represents STD station.)

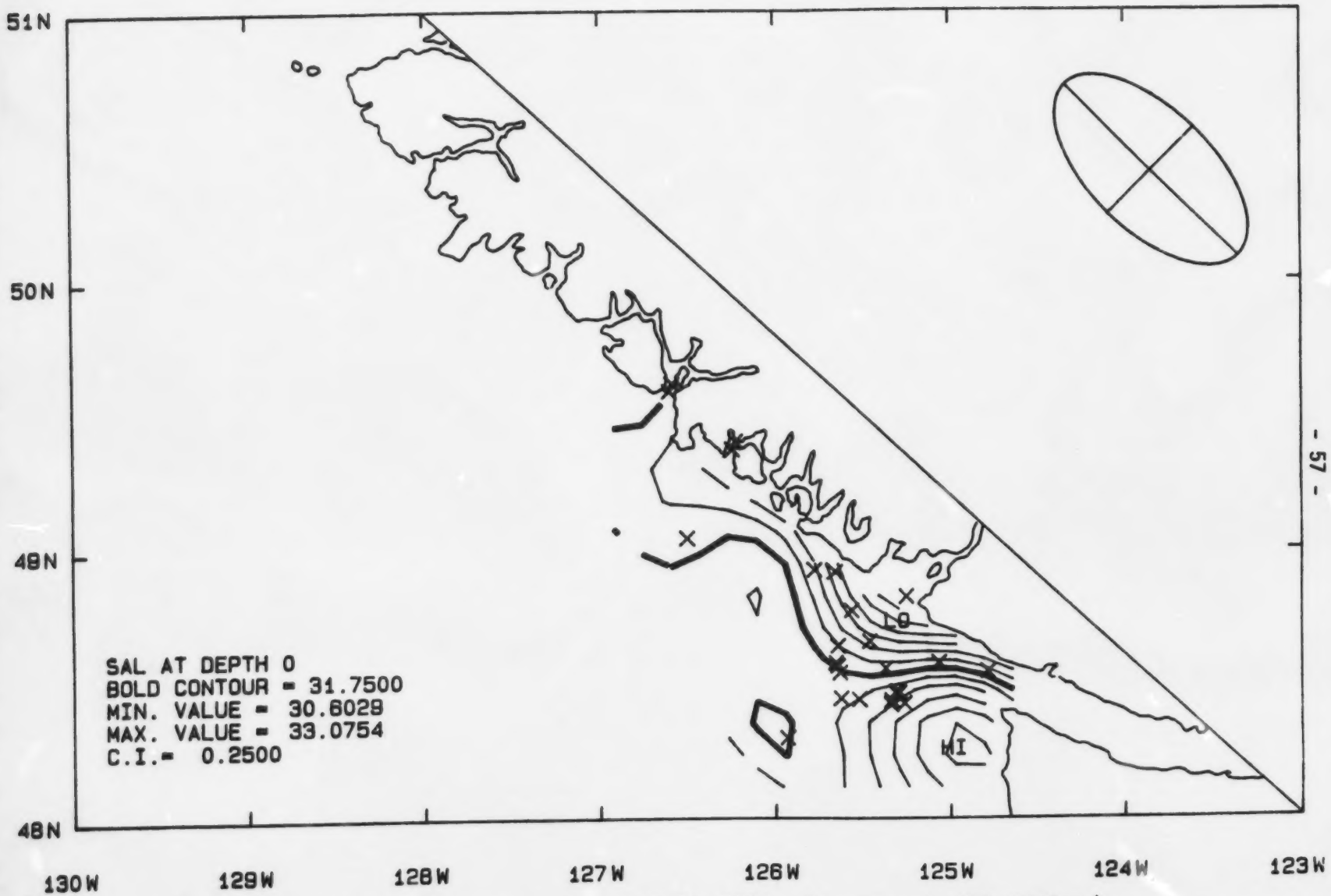


Fig. 13. Surface salinity (‰) profiles, August 12-25, 1986. (+ represents STD station.)

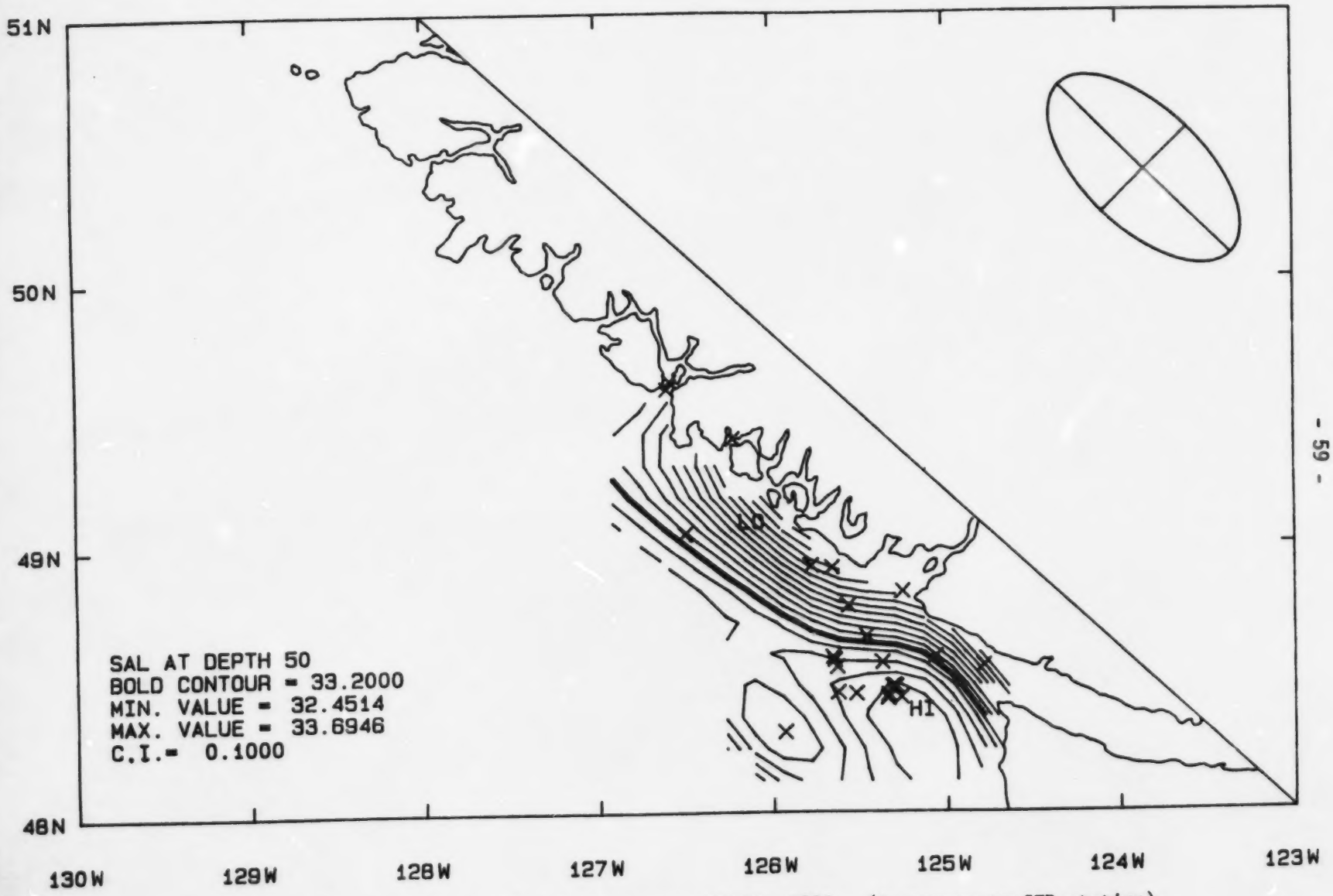


Fig. 14. Salinity (‰) profiles at 50 m depth, August 12-25, 1986. (+ represents STD station).

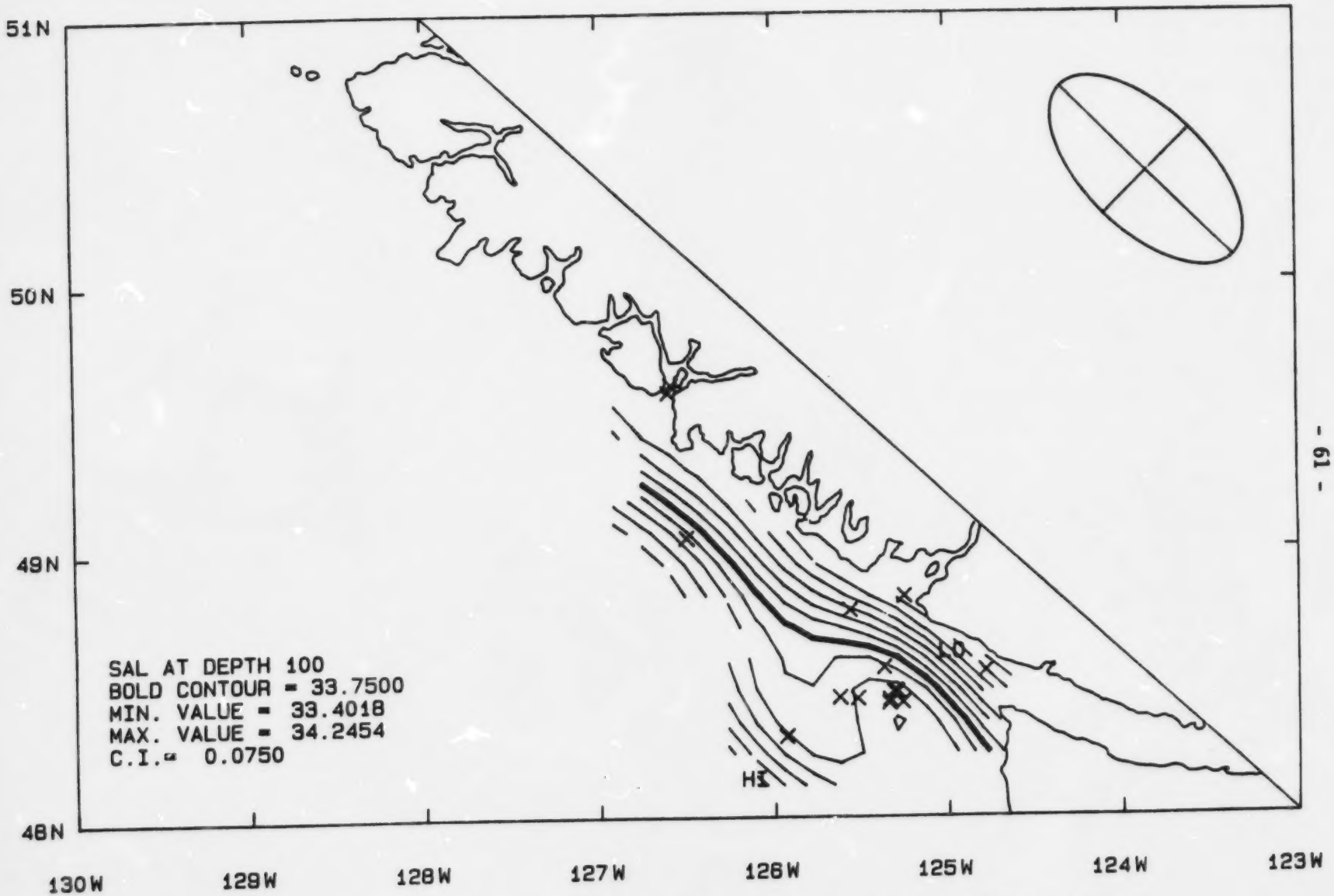


Fig. 15. Salinity (‰) profiles at 100 m depth, August 12-25, 1986. (+ represents STD station.)

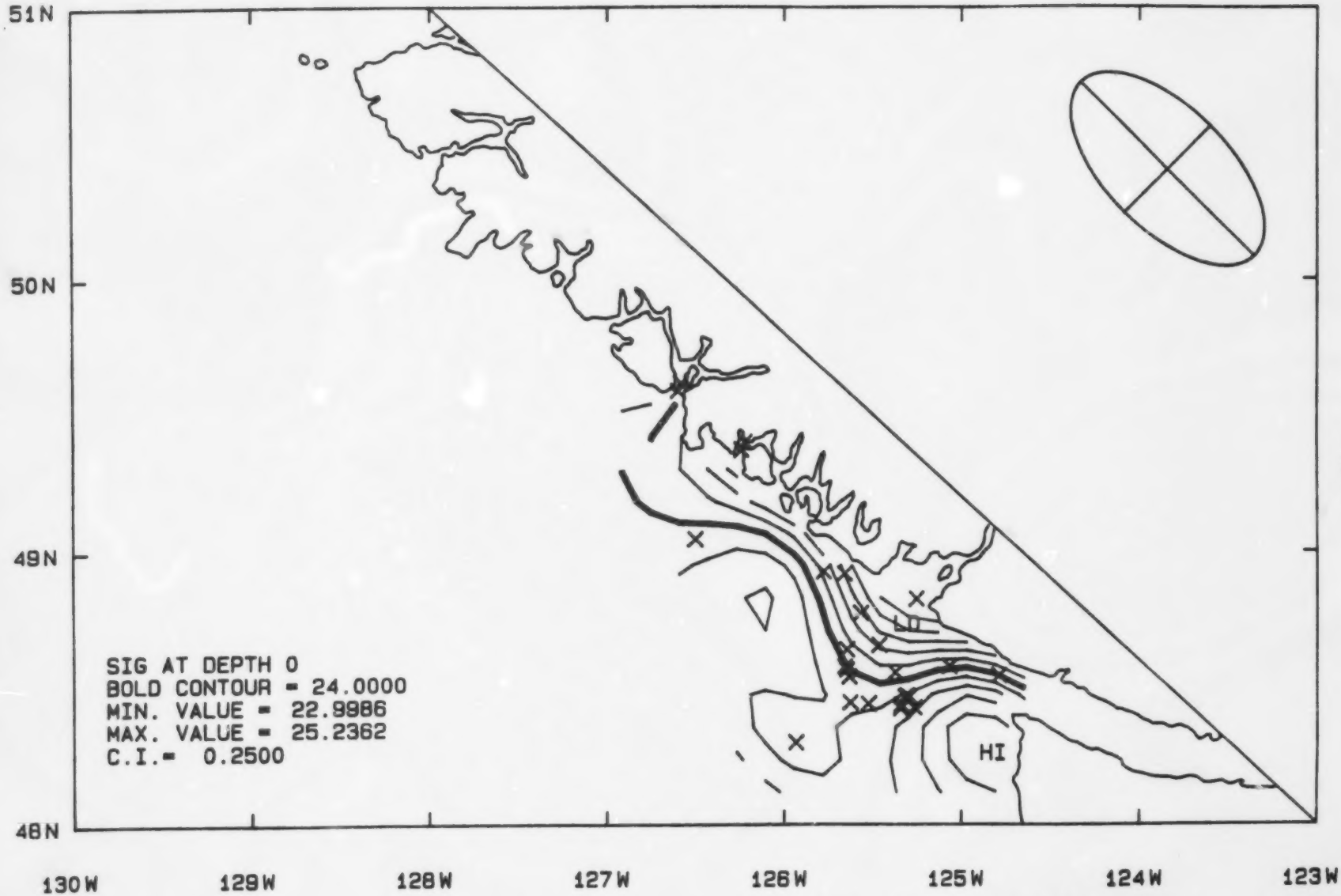


Fig. 16. Surface density or sigma-t (σ) profiles, August 12-25, 1986. (+ represents STD station.)

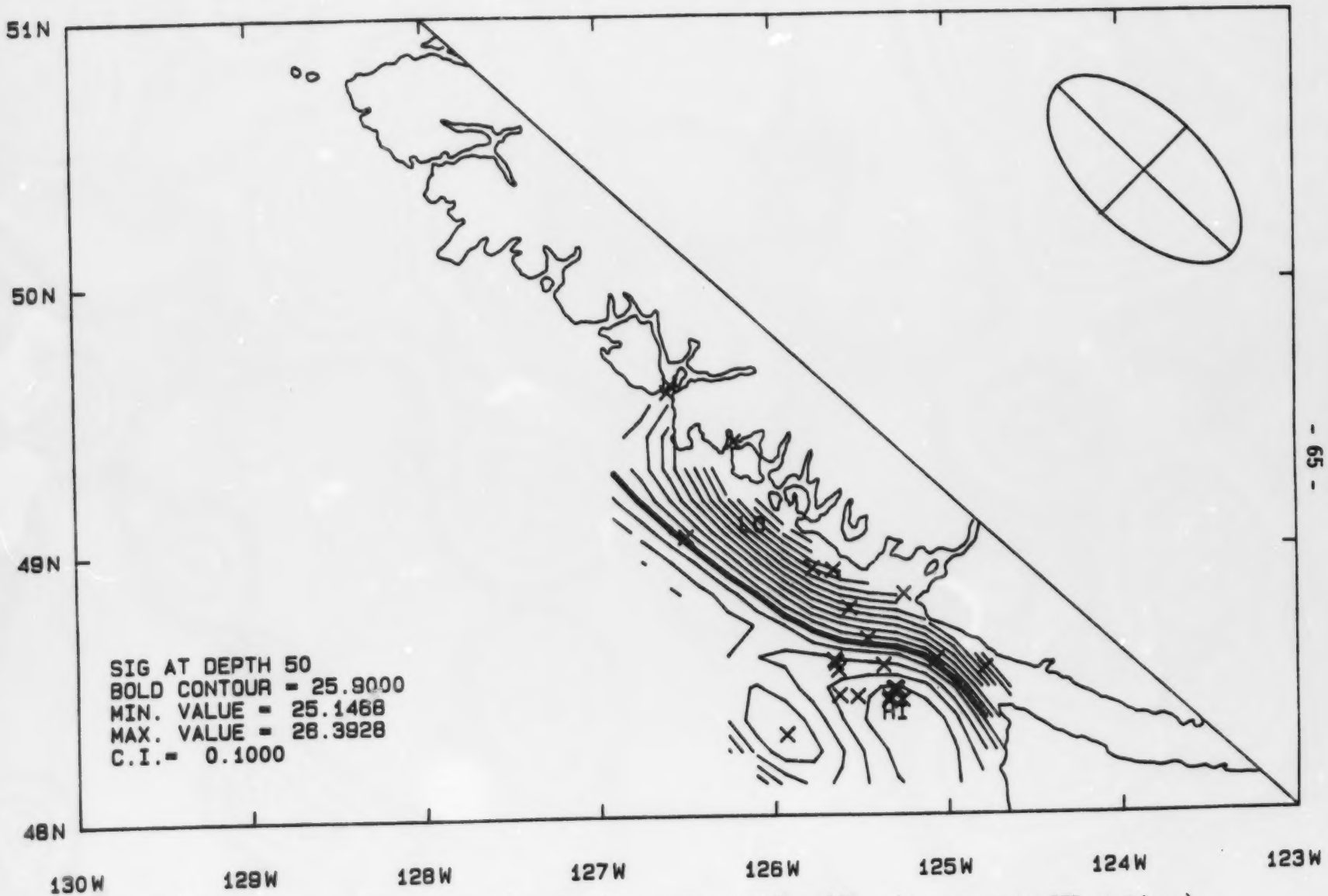


Fig. 17. Density or sigma-t (σ) profiles at 50 m, August 12-25, 1986. (+ represents STD station.)

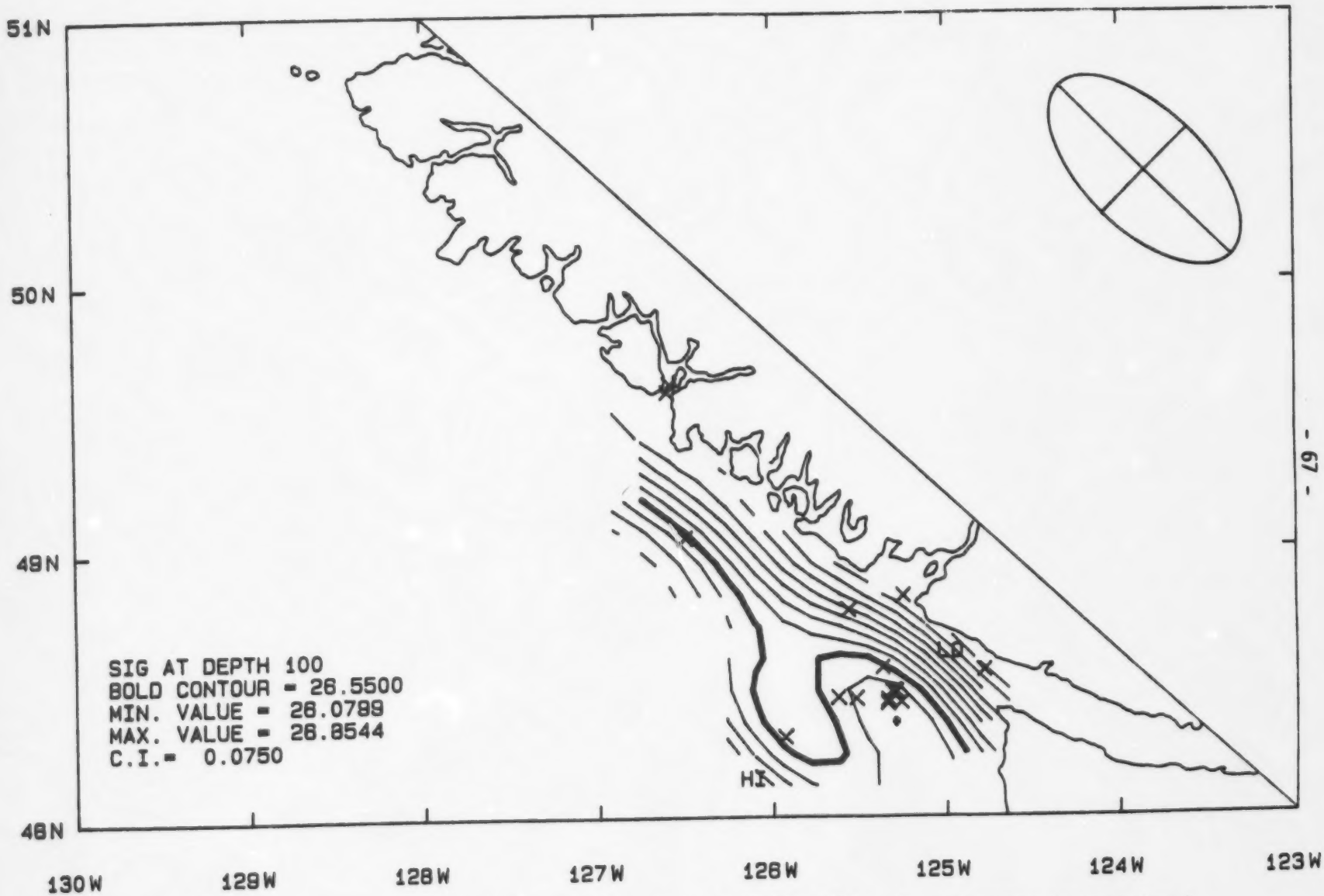


Fig. 18. Density or sigma-t (σ) profiles at 100 m, August 12-25, 1986. (+ represents STD station.)

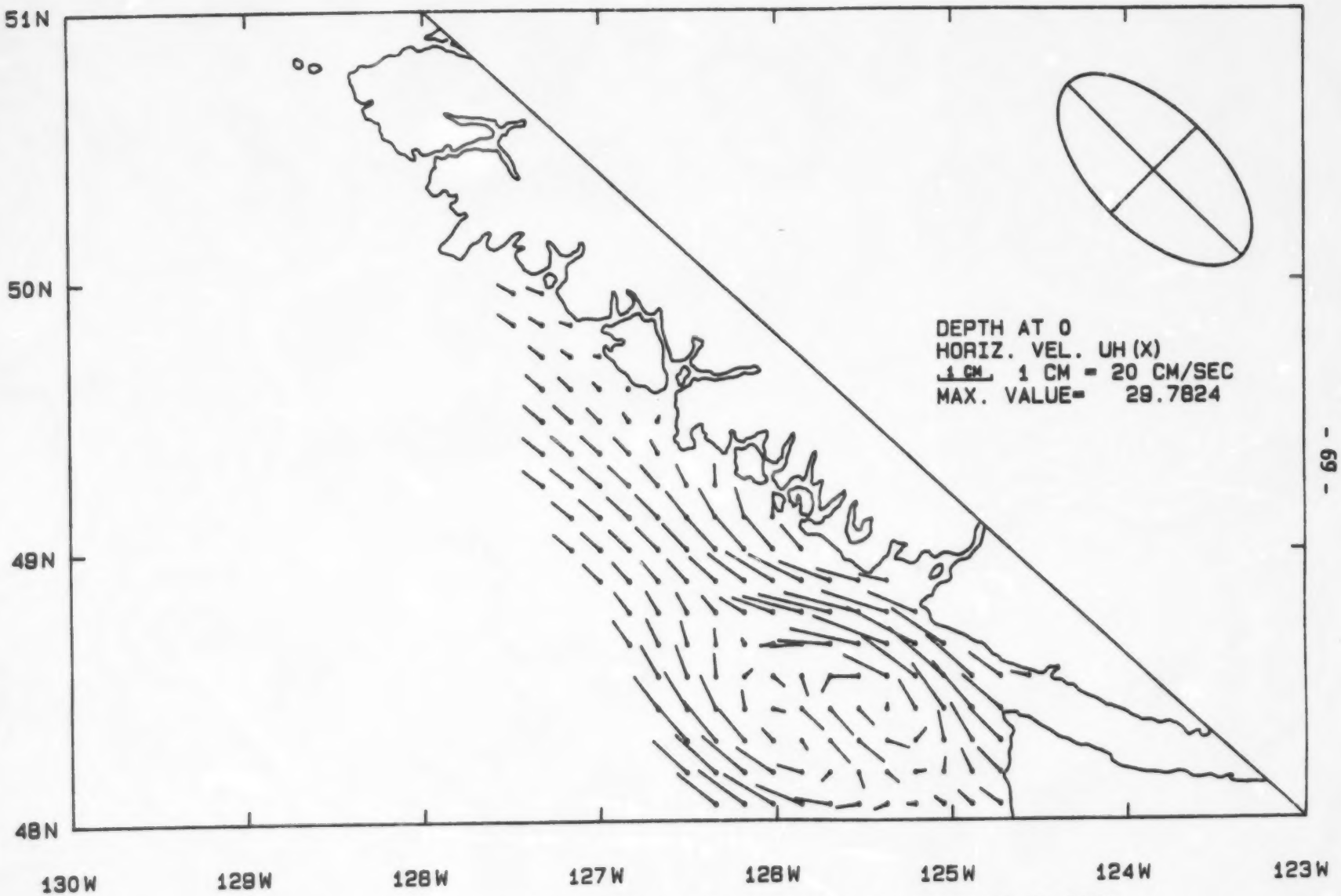


Fig. 19. Surface current velocity vectors (cm/sec) (relative to 100 m), August 12-25, 1986.

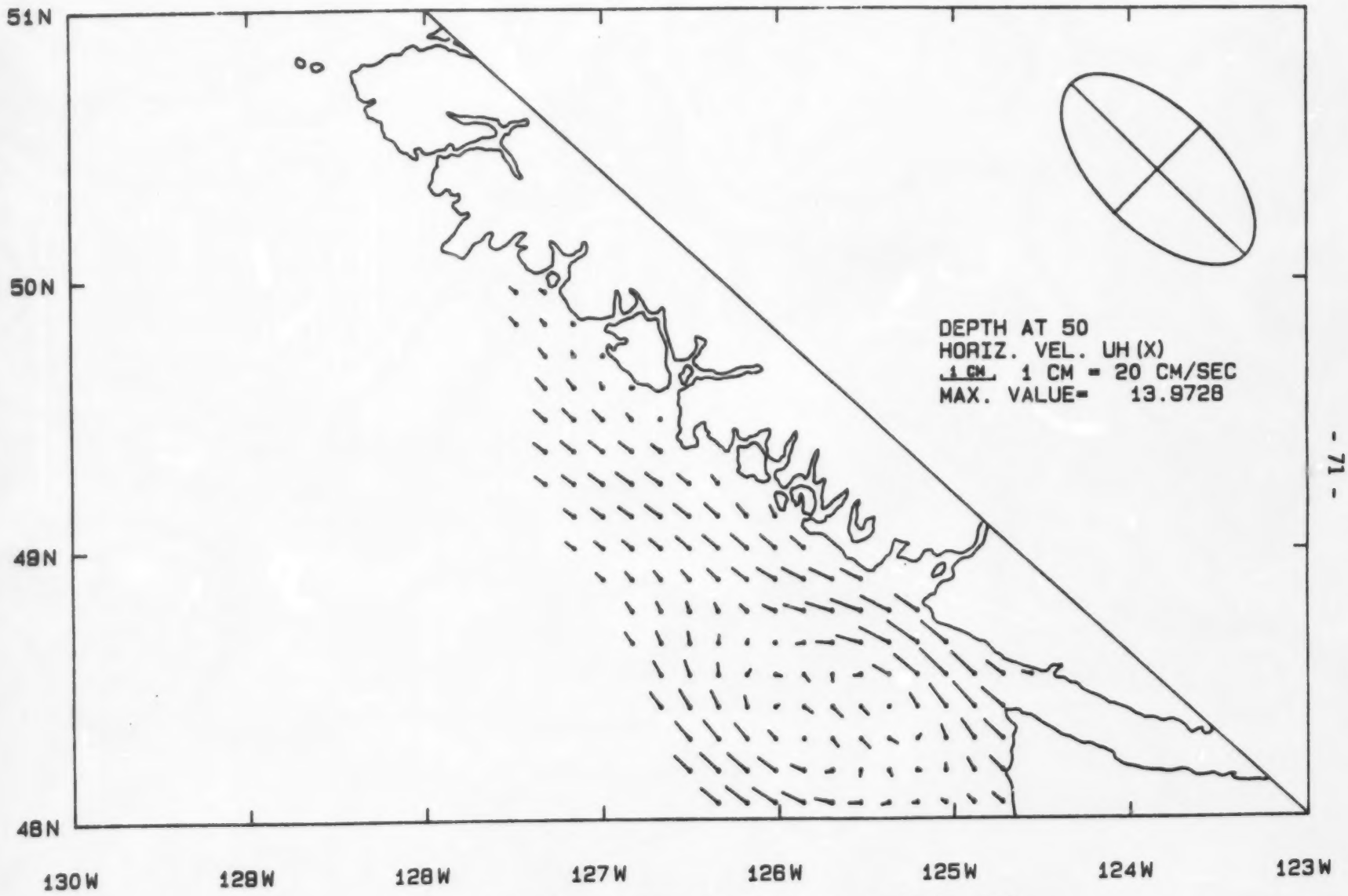


Fig. 20. Current velocity vectors (cm/sec) (relative to 100 m), August 12-25, 1986.

Appendix Table 1. Fishing log for the F/V CALEDONIAN, August 12-25, 1986. (see footnotes Appendix Table 1)

HAUL NUMBER		1	2	3	4
DATE		AUG 13	AUG 13	AUG 13	AUG 13
AREA (MAJOR, MINOR)		3C,23	3C,23	3C,21	3C,21
START TIME	PST)	8:22	11:20	14:48	16:30
DURATION	(MIN)	30	30	40	40
START N. LAT.	(DEG)	48	48	48	48
	(MIN)	34.6	30.3	28.4	24.6
W. LONG	(DEG)	125	125	125	125
	(MIN)	23.5	25.5	5.1	13.5
FINISH N. LAT.	(DEG)	48	48	48	48
	(MIN)	33.4	31.4	27.1	25.6
W. LONG	(DEG)	125	125	125	125
	(MIN)	22.3	23.8	7.6	15.9
HAUL DISTANCE	(KM)	2.8	2.6	2.8	3.1
	(N MI)	1.5	1.4	1.5	1.7
DIRECTION (DEG.TRUE)		0	0	181	0
BOTTOM DEPTH	(M)	146- 159	99- 102	172- 172	201- 176
	(FM)	80- 87	54- 56	94- 94	110- 96
MODAL DEPTH	(M)	151	100	172	188
NET/GEAR DEPTH	(M)	..- ..	..- ..	..- ..	..- ..
	(FM)	..- ..	..- ..	..- ..	..- ..
MODAL NET DEPTH	(M)	..	..	..	..
GEAR TYPE		100	100	100	100
TOTAL CATCH	(KG)	194	111	292	115
REMARKS		USABLE	USABLE	USABLE	USABLE

Appendix Table 1 (cont'd)

HAUL NUMBER	1	2	3	4
DATE	AUG 13	AUG 13	AUG 13	AUG 13
AREA (MAJOR, MINOR)	3C,23	3C,23	3C,21	3C,21
ARROWTOOTH FLOUNDER	12	11	50	5
DOVER SOLE	4	..	7	..
ENGLISH SOLE	..	1	..	..
FLATHEAD SOLE	1	..	..	..
PACIFIC HALIBUT	..	..	..	..
PETRALE SOLE	1	..	..	..
REX SOLE	2	1	16	2
S. ALEUTIANUS	..	..	..	2
S. ALUTUS	..	..	1	1
S. BABCOCKI	..	..	..	..
S. BREVISPINIS	..	..	..	..
S. CRAMERI	..	..	..	1
S. DIPLOPROA	..	..	..	..
S. ELONGATUS	..	..	5	..
S. ENTOMELAS	..	..	..	..
S. FLAVIDUS	..	..	..	..
S. PAUCISPINIS	..	..	..	..
S. PINNIGER	..	..	..	2
S. PRORIGER	..	..	..	..
S. REEDI	..	..	..	..
S. RUBERRIMUS	..	..	..	..
S. ZACENTRUS	..	..	..	..
SEB. ALASCANUS	..	..	..	1
AMERICAN SHAD	..	..	..	..
CHINOOK SALMON	..	..	..	..
COHO SALMON	..	..	..	..
EULACHON	..	..	..	..
LINGCOD	..	..	7	..
NORTHERN ANCHOVY	..	..	..	..
PACIFIC COD	4	..	2	11
PACIFIC HAKE	2	..	18	16
PACIFIC HERRING	..	..	..	..
PACIFIC TOMCOD	1	..	..	..
PINK SALMON	..	..	1	..
SABLEFISH	63	..	125	18
WALLEYE POLLOCK	11	..	2	27
PACIFIC ELECTRIC RAY	..	..	..	..
RATFISH	..	..	1	..
SPINY DOGFISH	91	98	57	27
OPAL SQUID	..	..	..	..
PINK SHRIMP	2	..	..	2
SIDESTRIPE SHRIMP	..	..	..	..
TOTAL CATCH (KG)	194	111	292	115

Appendix Table 1 (cont'd)

HAUL NUMBER		5	6	7	8
DATE		AUG 13	AUG 14	AUG 14	AUG 14
AREA (MAJOR, MINOR)		3C,23	3C,21	3C,21	3C,21
START TIME	PST)	19:02	7:30	9:10	11:16
DURATION	(MIN)	55	30	30	30
START N. LAT.	(DEG)	48	48	48	48
	(MIN)	32.7	17.3	19.3	20.9
W. LONG	(DEG)	125	125	125	125
	(MIN)	22.5	48.7	53.6	49.0
FINISH N. LAT.	(DEG)	48	48	48	48
	(MIN)	34.8	18.7	18.6	21.3
W. LONG	(DEG)	125	125	125	125
	(MIN)	24.0	50.4	55.3	46.5
HAUL DISTANCE	(KM)	3.5	4.6	3.9	4.1
	(N MI)	1.9	2.5	2.1	2.2
DIRECTION (DEG.TRUE)		0	317	215	0
BOTTOM DEPTH	(M)	119- 157	192- 183	293- 293	157- 152
	(FM)	65- 86	105- 100	160- 160	86- 83
MODAL DEPTH	(M)	138	188	293	155
NET/GEAR DEPTH	(M)	..- ..	..- ..	..- ..	..- ..
	(FM)	..- ..	..- ..	..- ..	..- ..
MODAL NET DEPTH	(M)	..	..	..	..
GEAR TYPE		100	100	100	100
TOTAL CATCH	(KG)	144	1526	395	215
REMARKS		USABLE	USABLE	USABLE	USABLE

Appendix Table 1 (cont'd)

HAUL NUMBER	5	6	7	8
DATE	AUG 13	AUG 14	AUG 14	AUG 14
AREA (MAJOR, MINOR)	3C,23	3C,21	3C,21	3C,21
ARROWTOOTH FLOUNDER	11	..	9	11
DOVER SOLE	4	..	4	..
ENGLISH SOLE	..	5	..	..
FLATHEAD SOLE	..	..	..	..
PACIFIC HALIBUT	..	..	..	..
PETRALE SOLE	..	..	..	..
REX SOLE	..	..	3	..
S. ALEUTIANUS	..	..	..	..
S. ALUTUS	2	..	59	80
S. BABCOCKI	..	..	7	..
S. BREVISPINIS	..	545	80	11
S. CRAMERI	1	..	..	..
S. DIPLOPROA	..	..	182	45
S. ELONGATUS	..	..	..	..
S. ENTOMELAS	..	14	..	2
S. FLAVIDUS	1	..	..	11
S. PAUCISPINIS	..	682	14	23
S. PINNIGER	..	14	4	18
S. PRORIGER	..	5	..	7
S. REEDI	..	227	18	..
S. RUBERRIMUS	..	..	..	5
S. ZACENTRUS	..	..	1	..
SEB. ALASCANUS	2	..	..	2
AMERICAN SHAD	..	..	..	..
CHINOOK SALMON	..	..	..	..
COHO SALMON	..	..	..	..
EULACHON	1	..	..	..
LINGCOD	3	..	..	..
NORTHERN ANCHOVY	..	..	..	..
PACIFIC COD	7	2	..	..
PACIFIC HAKE	16	18	7	..
PACIFIC HERRING	..	..	..	..
PACIFIC TOMCOD	..	..	..	..
PINK SALMON	..	..	..	..
SABLEFISH	39	9	7	..
WALLEYE POLLOCK	25	2	..	..
PACIFIC ELECTRIC RAY	..	..	..	..
RATFISH	..	..	..	..
SPINY DOGFISH	32	2	..	..
OPAL SQUID	..	..	..	..
PINK SHRIMP	..	..	..	..
SIDESTRIPE SHRIMP	..	1	..	..
TOTAL CATCH (KG)	144	1526	395	215

Appendix Table 1 (cont'd)

HAUL NUMBER		9	10	11	12
DATE		AUG 14	AUG 15	AUG 15	AUG 15
AREA (MAJOR, MINOR)		3C,23	3C,23	3C,23	3C,23
START TIME	PST)	13:20	15:50	8:18	11:47
DURATION	(MIN)	10	40	30	40
START N. LAT.	(DEG)	48	48	48	48
	(MIN)	27.0	29.6	36.6	34.3
W. LONG	(DEG)	125	125	125	125
	(MIN)	38.3	35.6	29.2	22.6
FINISH N. LAT.	(DEG)	48	48	48	48
	(MIN)	26.8	29.8	36.4	35.2
W. LONG	(DEG)	125	125	125	125
	(MIN)	37.6	32.3	31.6	24.6
HAUL DISTANCE	(KM)	1.9	2.2	4.6	5.2
	(N MI)	1.0	1.2	2.5	2.8
DIRECTION (DEG.TRUE)		126	125	252	312
BOTTOM DEPTH	(M)	108- 108	119- 135	179- 155	161- 145
	(FM)	59- 59	65- 74	98- 85	88- 79
MODAL DEPTH	(M)	108	127	194	153
NET/GEAR DEPTH	(M)	..- ..	..- ..	..- ..	..- ..
	(FM)	..- ..	..- ..	..- ..	..- ..
MODAL NET DEPTH	(M)	..	..	..	..
GEAR TYPE		100	100	100	100
TOTAL CATCH	(KG)	1464	74	386	230
REMARKS		USABLE	USABLE	USABLE	USABLE

Appendix Table 1 (cont'd)

HAUL NUMBER	9	10	11	12
DATE	AUG 14	AUG 15	AUG 15	AUG 15
AREA (MAJOR, MINOR)	3C,23	3C,23	3C,23	3C,23
ARROWTOOTH FLOUNDER	18	9	34	50
DOVER SOLE	..	1	19	9
ENGLISH SOLE	..	1	..	..
FLATHEAD SOLE	..	..	..	3
PACIFIC HALIBUT	..	..	..	11
PETRALE SOLE	..	..	..	..
REX SOLE	..	1	16	18
S. ALEUTIANUS	..	..	..	..
S. ALUTUS	2	..	..	..
S. BABCOCKI	..	..	..	..
S. BREVISPINIS	9	..	..	..
S. CRAMERI	..	1	1	..
S. DIPLOPROA	2	..	..	..
S. ELONGATUS	..	..	..	..
S. ENTOMELAS	7	..	..	..
S. FLAVIDUS	5	..	..	..
S. PAUCISPINIS	..	..	..	..
S. PINNIGER	7	..	..	..
S. PRORIGER	16	1	..	..
S. REEDI	..	..	..	..
S. RUBERRIMUS	..	..	..	..
S. ZACENTRUS	..	1	..	..
SEB. ALASCANUS	..	..	..	..
AMERICAN SHAD	..	1	..	..
CHINOOK SALMON	..	..	..	..
COHO SALMON	..	..	..	..
EULACHON	..	1	..	1
LINGCOD	..	..	..	..
NORTHERN ANCHOVY	..	..	..	..
PACIFIC COD	..	..	..	..
PACIFIC HAKE	1364	45	27	82
PACIFIC HERRING	..	..	..	..
PACIFIC TOMCOD	..	..	..	..
PINK SALMON	..	..	..	..
SABLEFISH	14	9	27	36
WALLEYE POLLOCK	9	1	227	9
PACIFIC ELECTRIC RAY	..	..	..	..
RATFISH	..	..	5	..
SPINY DOGFISH	11	..	30	11
OPAL SQUID	..	..	..	..
PINK SHRIMP	..	2	..	..
SIDESTRIPE SHRIMP	..	..	..	..
TOTAL CATCH (KG)	1464	74	386	230

Appendix Table 1 (cont'd)

HAUL NUMBER		13	14	15	16
DATE		AUG 15	AUG 16	AUG 16	AUG 17
AREA (MAJOR, MINOR)		3C,23	3C,23	3C,24	3C,24
START TIME	PST)	14:52	10:48	17:13	9:03
DURATION	(MIN)	35	15	6	30
START N. LAT.	(DEG)	48	48	49	49
	(MIN)	32.6	54.9	1.9	23.8
W. LONG	(DEG)	125	125	126	126
	(MIN)	36.0	38.6	30.4	11.2
FINISH N. LAT.	(DEG)	48	48	49	49
	(MIN)	32.5	55.1	2.8	24.2
W. LONG	(DEG)	125	125	126	126
	(MIN)	38.0	39.5	30.1	13.4
HAUL DISTANCE	(KM)	2.8	2.0	3.0	2.8
	(N MI)	1.5	1.1	1.6	1.5
DIRECTION (DEG.TRUE)		280	265	354	254
BOTTOM DEPTH	(M)	81- 75	95- 95	146- 145	75- 60
	(FM)	44- 41	52- 52	80- 79	41- 33
MODAL DEPTH	(M)	78	95	145	67
NET/GEAR DEPTH	(M)	..- ..	60- 81	91- 88	49- 48
	(FM)	..- ..	33- 44	50- 48	27- 26
MODAL NET DEPTH	(M)	..	70	90	49
GEAR TYPE		100	222	222	222
TOTAL CATCH	(KG)	26863	1364	1818	93
REMARKS		USABLE	USABLE	USABLE	USABLE

Appendix Table 1 (cont'd)

HAUL NUMBER	13	14	15	16
DATE	AUG 15	AUG 16	AUG 16	AUG 17
AREA (MAJOR, MINOR)	3C,23	3C,23	3C,24	3C,24
ARROWTOOTH FLOUNDER	..	..	..	..
DOVER SOLE	..	..	..	..
ENGLISH SOLE	..	..	..	..
FLATHEAD SOLE	..	..	..	..
PACIFIC HALIBUT	..	..	..	..
PETRALE SOLE	..	..	..	..
REX SOLE	..	..	..	..
S. ALEUTIANUS	..	..	..	..
S. ALUTUS	..	..	..	..
S. BABCOCKI	..	..	..	..
S. BREVISPINIS	..	..	..	..
S. CRAMERI	..	..	..	..
S. DIPLOPROA	..	..	..	..
S. ELONGATUS	..	..	..	..
S. ENTOMELAS	..	..	..	..
S. FLAVIDUS	..	..	..	1
S. PAUCISPINIS	..	..	..	1
S. PINNIGER	..	..	..	..
S. PRORIGER	..	..	..	..
S. REEDI	..	..	..	..
S. RUBERRIMUS	..	..	..	..
S. ZACENTRUS	..	..	..	..
SEB. ALASCANUS	..	..	..	..
AMERICAN SHAD	..	..	..	1
CHINOOK SALMON	..	..	..	9
COHO SALMON	..	..	..	..
EULACHON	..	..	..	..
LINGCOD	45	9	..	1
NORTHERN ANCHOVY	..	..	..	1
PACIFIC COD	..	..	..	..
PACIFIC HAKE	..	1355	1818	23
PACIFIC HERRING	..	..	..	1
PACIFIC TOMCOD	..	..	..	..
PINK SALMON	..	..	..	..
SABLEFISH	1818	..	..	..
WALLEYE POLLOCK	..	..	..	..
PACIFIC ELECTRIC RAY	..	..	..	9
RATFISH	..	..	..	..
SPINY DOGFISH	25000	..	..	45
OPAL SQUID	..	..	..	1
PINK SHRIMP	..	..	..	..
SIDESTRIPE SHRIMP	..	..	..	..
TOTAL CATCH (KG)	26863	1364	1818	93

Appendix Table 1 (cont'd)

HAUL NUMBER	17	18	19	20
DATE	AUG 17	AUG 17	AUG 18	AUG 19
AREA (MAJOR, MINOR)	3C,24	3D,25	3D,25	3C,23
START TIME PST)	11:23	20:27	10:50	13:54
DURATION (MIN)	22	30	14	9
START N. LAT. (DEG)	49	49	49	48
(MIN)	23.5	35.7	52.2	56.2
W. LONG (DEG)	126	126	126	125
(MIN)	14.4	35.9	39.6	47.2
FINISH N. LAT. (DEG)	49	49	49	48
(MIN)	22.4	35.3	51.5	55.5
W. LONG (DEG)	126	126	126	125
(MIN)	14.6	36.1	39.5	46.6
HAUL DISTANCE (KM)	2.6	3.3	2.0	3.0
(N MI)	1.4	1.8	1.1	1.6
DIRECTION (DEG.TRUE)	179	343	173	134
BOTTOM DEPTH (M)	66- 44	113- 104	194- 194	66- 95
(FM)	36- 24	62- 57	106- 106	36- 52
MODAL DEPTH (M)	55	109	194	81
NET/GEAR DEPTH (M)	33- 22	82- 82	146- 146	37- 37
(FM)	18- 12	45- 45	80- 80	20- 20
MODAL NET DEPTH (M)	27	82	146	37
GEAR TYPE	222	222	222	222
TOTAL CATCH (KG)	150	7034	49	1383
REMARKS	USABLE	USABLE	USABLE	USABLE

Appendix Table 1 (cont'd)

HAUL NUMBER	17	18	19	20
DATE	AUG 17	AUG 17	AUG 18	AUG 19
AREA (MAJOR, MINOR)	3C,24	3D,25	3D,25	3C,23
ARROWTOOTH FLOUNDER	..	..	..	..
DOVER SOLE	..	..	..	..
ENGLISH SOLE	..	..	..	..
FLATHEAD SOLE	..	..	..	..
PACIFIC HALIBUT	..	..	..	..
PETRALE SOLE	..	..	..	..
REX SOLE	..	..	..	..
S. ALEUTIANUS	..	..	..	..
S. ALUTUS	..	..	..	..
S. BABCOCKI	..	..	..	..
S. BREVISPINIS	..	..	..	..
S. CRAMERI	..	..	..	..
S. DIPLOPROA	..	..	..	..
S. ELONGATUS	..	..	..	..
S. ENTOMELAS	..	..	..	..
S. FLAVIDUS	..	30	..	1
S. PAUCISPINIS	..	182	24	4
S. PINNIGER	..	..	..	..
S. PRORIGER	..	..	..	..
S. REEDI	..	..	..	..
S. RUBERRIMUS	..	..	..	..
S. ZACENTRUS	..	..	..	..
SEB. ALASCANUS	..	..	..	..
AMERICAN SHAD	..	..	..	..
CHINOOK SALMON	20	3	..	4
COHO SALMON	..	..	..	..
EULACHON	7	..	..	..
LINGCOD	..	..	..	9
NORTHERN ANCHOVY	7	..	..	..
PACIFIC COD	..	..	..	..
PACIFIC HAKE	..	6818	25	1364
PACIFIC HERRING	16	..	..	1
PACIFIC TOMCOD	..	..	..	..
PINK SALMON	..	..	..	..
SABLEFISH	..	..	..	..
WALLEYE POLLOCK	..	..	..	..
PACIFIC ELECTRIC RAY	..	..	..	..
RATFISH	..	..	..	..
SPINY DOGFISH	100	..	..	..
OPAL SQUID	..	1	..	..
PINK SHRIMP	..	..	..	..
SIDESTRIPE SHRIMP	..	..	..	..
TOTAL CATCH (KG)	150	7034	49	1383

Appendix Table 1 (cont'd)

HAUL NUMBER		21	22	23	24
DATE		AUG 19	AUG 20	AUG 21	AUG 21
AREA (MAJOR, MINOR)		3C,23	3C,23	3C,23	3C,21
START TIME	PST)	19:00	11:35	7:30	12:16
DURATION	(MIN)	27	19	16	8
START N. LAT.	(DEG)	48	48	48	48
	(MIN)	47.8	38.8	32.3	34.6
W. LONG	(DEG)	125	125	125	125
	(MIN)	33.5	37.4	36.1	3.4
FINISH N. LAT.	(DEG)	48	48	48	48
	(MIN)	46.4	38.4	34.0	34.7
W. LONG	(DEG)	125	125	125	125
	(MIN)	34.0	38.7	38.8	4.0
HAUL DISTANCE	(KM)	3.5	2.6	3.7	1.9
	(N MI)	1.9	1.4	2.0	1.0
DIRECTION (DEG.TRUE)		145	237	119	248
BOTTOM DEPTH	(M)	110- 157	64- 55	75- 77	88- 99
	(FM)	60- 86	35- 30	41- 42	48- 54
MODAL DEPTH	(M)	137	60	76	93
NET/GEAR DEPTH	(M)	64- 57	27- 17	46- 46	55- 55
	(FM)	35- 31	15- 9	25- 25	30- 30
MODAL NET DEPTH	(M)	60	23	46	55
GEAR TYPE		222	222	222	222
TOTAL CATCH	(KG)	323	2288	616	482
REMARKS		USABLE	USABLE	USABLE	USABLE

Appendix Table 1 (cont'd)

HAUL NUMBER	21	22	23	24
DATE	AUG 19	AUG 20	AUG 21	AUG 21
AREA (MAJOR, MINOR)	3C,23	3C,23	3C,23	3C,21
ARROWTOOTH FLOUNDER	..	..	..	..
DOVER SOLE	..	..	..	..
ENGLISH SOLE	..	..	..	..
FLATHEAD SOLE	..	..	..	..
PACIFIC HALIBUT	..	..	..	..
PETRALE SOLE	..	..	..	..
REX SOLE	..	..	..	..
S. ALEUTIANUS	..	..	..	..
S. ALUTUS	..	..	..	..
S. BABCOCKI	..	..	..	..
S. BREVISPINIS	..	..	..	..
S. CRAMERI	..	..	..	..
S. DIPLOPROA	..	..	..	..
S. ELONGATUS	..	..	..	..
S. ENTOMELAS	..	..	..	..
S. FLAVIDUS	..	..	..	..
S. PAUCISPINIS	..	..	..	..
S. PINNIGER	..	..	..	..
S. PRORIGER	..	..	..	..
S. REEDI	..	..	..	..
S. RUBERRIMUS	..	..	..	..
S. ZACENTRUS	..	..	..	..
SEB. ALASCANUS	..	..	..	..
AMERICAN SHAD	..	..	..	..
CHINOOK SALMON	..	14	..	27
COHO SALMON	..	..	..	..
EULACHON	..	..	..	91
LINGCOD	..	..	..	..
NORTHERN ANCHOVY	..	..	..	..
PACIFIC COD	..	..	..	..
PACIFIC HAKE	318	..	..	..
PACIFIC HERRING	..	1	455	273
PACIFIC TOMCOD	..	..	..	..
PINK SALMON	..	..	..	..
SABLEFISH	..	..	2	..
WALLEYE POLLOCK	..	..	..	..
PACIFIC ELECTRIC RAY	..	..	..	..
RATFISH	..	..	..	..
SPINY DOGFISH	5	2273	159	91
OPAL SQUID	..	..	..	..
PINK SHRIMP	..	..	..	..
SIDESTRIPE SHRIMP	..	..	..	..
TOTAL CATCH (KG)	323	2288	616	482

Appendix Table 1 (cont'd)

HAUL NUMBER		25	26	27	28
DATE		AUG 21	AUG 21	AUG 22	AUG 22
AREA (MAJOR, MINOR)		3C,21	3C,21	3C,21	3C,21
START TIME	PST)	15:10	20:40	7:18	13:25
DURATION	(MIN)	35	10	12	22
START N. LAT.	(DEG)	48	48	48	48
	(MIN)	32.8	25.8	28.2	27.1
W. LONG	(DEG)	124	125	125	125
	(MIN)	45.5	20.8	18.3	19.8
FINISH N. LAT.	(DEG)	48	48	48	48
	(MIN)	32.7	26.1	28.0	26.2
W. LONG	(DEG)	124	125	125	125
	(MIN)	47.2	20.2	19.0	20.3
HAUL DISTANCE	(KM)	2.2	1.9	2.0	2.2
	(N MI)	1.2	1.0	1.1	1.2
DIRECTION (DEG.TRUE)		233	36	223	180
BOTTOM DEPTH	)	135- 143	181- 185	159- 161	168- 188
	(FM)	74- 78	99- 101	87- 88	92- 103
MODAL DEPTH	(M)	139	183	160	178
NET/GEAR DEPTH	(M)	64- 73	128- 110	106- 106	143- 148
	(FM)	35- 40	70- 60	58- 58	78- 81
MODAL NET DEPTH	(M)	70	119	106	145
GEAR TYPE		222	222	222	222
TOTAL CATCH	(KG)	2471	1530	2022	2863
REMARKS		USABLE	USABLE	USABLE	USABLE

Appendix Table 1 (cont'd)

HAUL NUMBER	25	26	27	28
DATE	AUG 21	AUG 21	AUG 22	AUG 22
AREA (MAJOR, MINOR)	3C,21	3C,21	3C,21	3C,21
ARROWTOOTH FLOUNDER	..	..	..	..
DOVER SOLE	..	..	..	..
ENGLISH SOLE	..	..	..	..
FLATHEAD SOLE	..	..	..	..
PACIFIC HALIBUT	..	..	..	..
PETRALE SOLE	..	..	..	..
REX SOLE	..	..	..	..
S. ALEUTIANUS	..	..	..	..
S. ALUTUS	..	..	..	..
S. BABCOCKI	..	..	..	..
S. BREVISPINIS	..	..	..	..
S. CRAMERI	..	..	..	..
S. DIPLOPROA	..	..	..	..
S. ELONGATUS	..	..	..	..
S. ENTOMELAS	..	2	..	..
S. FLAVIDUS	136	..	..	..
S. PAUCISPINIS	23	9	..	..
S. PINNIGER	..	..	..	..
S. PRORIGER	..	..	..	..
S. REEDI	..	..	..	..
S. RUBERRIMUS	..	..	..	..
S. ZACENTRUS	..	..	..	..
SEB. ALASCANUS	..	..	..	..
AMERICAN SHAD	..	..	..	..
CHINOOK SALMON	..	..	..	..
COHO SALMON	..	..	..	..
EULACHON	..	..	..	..
LINGCOD	..	..	..	..
NORTHERN ANCHOVY	..	..	..	..
PACIFIC COD	..	..	..	..
PACIFIC HAKE	2273	1455	1818	2727
PACIFIC HERRING	..	..	..	..
PACIFIC TOMCOD	..	..	..	..
PINK SALMON	..	..	..	..
SABLEFISH	..	..	..	..
WALLEYE POLLOCK	3	..	136	91
PACIFIC ELECTRIC RAY	..	..	..	..
RATFISH	..	..	..	..
SPINY DOGFISH	36	64	68	45
OPAL SQUID	..	..	..	..
PINK SHRIMP	..	..	..	..
SIDESTRIPE SHRIMP	..	..	..	..
TOTAL CATCH (KG)	2471	1530	2022	2863

Appendix Table 1 (cont'd)

HAUL NUMBER		29	30	31	32
DATE		AUG 22	AUG 22	AUG 22	AUG 23
AREA (MAJOR, MINOR)		3C,21	3C,21	3C,21	3C,21
START TIME	PST)	16:40	17:36	21:00	6:26
DURATION	(MIN)	10	30	15	48
START N. LAT.	(DEG)	48	48	48	48
	(MIN)	27.1	26.6	26.9	26.9
W. LONG	(DEG)	125	125	125	125
	(MIN)	19.5	19.4	20.3	20.2
FINISH N. LAT.	(DEG)	48	48	48	48
	(MIN)	26.7	28.0	27.7	28.2
W. LONG	(DEG)	125	125	125	125
	(MIN)	20.0	17.6	20.2	18.3
HAUL DISTANCE	(KM)	1.9	2.8	2.0	4.1
	(N MI)	1.0	1.5	1.1	2.2
DIRECTION (DEG.TRUE)		197	36	344	28
BOTTOM DEPTH	(M)	168- 174	177- 161	166- 161	179- 159
	(FM)	92- 95	97- 88	91- 88	98- 87
MODAL DEPTH	(M)	170	169	163	169
NET/GEAR DEPTH	(M)	132- 132	37 42	16- 15	91- 110
	(FM)	72- 72	20- 23	9- 8	50- 60
MODAL NET DEPTH	(M)	132	40	16	95
GEAR TYPE		222	222	222	222
TOTAL CATCH	(KG)	1629	41	303	258
REMARKS		USABLE	USABLE	USABLE	USABLE

Appendix Table 1 (cont'd)

HAUL NUMBER	29	30	31	32
DATE	AUG 22	AUG 22	AUG 22	AUG 23
AREA (MAJOR, MINOR)	3C,21	3C,21	3C,21	3C,21
ARROWTOOTH FLOUNDER	2	..	..	..
DOVER SOLE	..	..	..	..
ENGLISH SOLE	..	..	..	..
FLATHEAD SOLE	..	..	..	..
PACIFIC HALIBUT	..	..	..	..
PETRALE SOLE	..	..	..	..
REX SOLE	..	..	..	..
S. ALEUTIANUS	..	..	..	..
S. ALUTUS	..	..	..	..
S. BABCOCKI	..	..	..	..
S. BREVISPINIS	..	..	..	..
S. CRAMERI	..	..	..	..
S. DIPLOPROA	..	..	..	..
S. ELONGATUS	..	..	..	..
S. ENTOMELAS	..	..	..	7
S. FLAVIDUS	..	..	1	27
S. PAUCISPINIS	..	..	..	..
S. PINNIGER	..	..	..	..
S. PRORIGER	..	..	..	..
S. REEDI	..	..	..	..
S. RUBERRIMUS	..	..	..	..
S. ZACENTRUS	..	..	..	..
SEB. ALASCANUS	..	..	..	..
AMERICAN SHAD	..	..	..	..
CHINOOK SALMON	..	..	3	..
COHO SALMON	..	..	1	..
EULACHON	..	..	..	1
LINGCOD	..	..	..	..
NORTHERN ANCHOVY	..	..	..	..
PACIFIC COD	..	..	..	..
PACIFIC HAKE	1591	9	3	182
PACIFIC HERRING	..	..	..	..
PACIFIC TOMCOD	..	..	..	..
PINK SALMON	..	..	..	..
SABLEFISH	..	..	..	..
WALLEYE POLLOCK	18	..	..	..
PACIFIC ELECTRIC RAY	..	..	..	..
RATFISH	..	..	..	..
SPINY DOGFISH	18	32	295	41
OPAL SQUID	..	..	..	..
PINK SHRIMP	..	..	..	..
SIDESTRIPE SHRIMP	..	..	..	..
TOTAL CATCH (KG)	1629	41	303	258

Appendix Table 1 (cont'd)

HAUL NUMBER		33	34	35	36
DATE		AUG 23	AUG 23	AUG 23	AUG 24
AREA (MAJOR, MINOR)		3C,21	3C,21	3C,21	3C,23
START TIME	PST)	10:06	14:20	18:25	8:34
DURATION	(MIN)	34	50	11	12
START N. LAT.	(DEG)	48	48	48	48
	(MIN)	26.1	27.0	26.5	54.4
W. LONG	(DEG)	125	125	125	125
	(MIN)	20.3	19.4	30.8	41.2
FINISH N. LAT.	(DEG)	48	48	48	48
	(MIN)	27.7	25.4	26.5	34.0
W. LONG	(DEG)	125	125	125	125
	(MIN)	19.5	20.5	31.4	42.5
HAUL DISTANCE	(KM)	2.8	3.0	2.0	0.0
	(N MI)	1.5	1.6	1.1	0.0
DIRECTION (DEG.TRUE)		351	165	261	259
BOTTOM DEPTH	(M)	185- 163	164- 161	126- 126	84- 86
	(FM)	101- 89	90- 88	69- 69	46- 47
MODAL DEPTH	(M)	173	162	126	85
NET/GEAR DEPTH	(M)	110- 110	141- 141	88- 88	59- 59
	(FM)	60- 60	77- 77	48- 48	32- 32
MODAL NET DEPTH	(M)	110	141	88	59
GEAR TYPE		222	222	222	222
TOTAL CATCH	(KG)	132	373	2861	1600
REMARKS		USABLE	USABLE	USABLE	USABLE

Appendix Table 1 (cont'd)

HAUL NUMBER	33	34	35	36
DATE	AUG 23	AUG 23	AUG 23	AUG 24
AREA (MAJOR, MINOR)	3C,21	3C,21	3C,21	3C,23
ARROWTOOTH FLOUNDER	..	2	..	..
DOVER SOLE	..	..	..	..
ENGLISH SOLE	..	..	..	..
FLATHEAD SOLE	..	..	..	..
PACIFIC HALIBUT	..	..	..	..
PETRALE SOLE	..	..	..	..
REX SOLE	..	..	..	..
S. ALEUTIANUS	..	..	..	..
S. ALUTUS	..	..	..	..
S. BABCOCKI	..	..	..	..
S. BREVISPINIS	..	..	..	..
S. CRAMERI	..	..	..	..
S. DIPLOPROA	..	..	..	..
S. ELONGATUS	..	..	..	..
S. ENTOMELAS	..	..	..	..
S. FLAVIDUS	2	1	114	..
S. PAUCISPINIS	..	..	..	..
S. PINNIGER	..	..	..	..
S. PRORIGER	..	..	..	..
S. REEDI	..	..	..	..
S. RUBERRIMUS	..	..	..	..
S. ZACENTRUS	..	..	..	..
SEB. ALASCANUS	..	..	..	..
AMERICAN SHAD	1	..	..	..
CHINOOK SALMON	..	..	..	2
COHO SALMON	..	..	..	..
EULACHON	1	1	..	1
LINGCOD	..	..	..	..
NORTHERN ANCHOVY	..	..	..	..
PACIFIC COD	..	..	..	..
PACIFIC HAKE	82	318	2727	1591
PACIFIC HERRING	1	..	..	1
PACIFIC TOMCOD	..	..	..	..
PINK SALMON	..	..	..	..
SABLEFISH	..	..	..	..
WALLEYE POLLOCK	..	1	..	..
PACIFIC ELECTRIC RAY	..	..	..	..
RATFISH	..	..	..	..
SPINY DOGFISH	45	50	20	5
OPAL SQUID	..	..	..	..
PINK SHRIMP	..	..	..	..
SIDESTRIPE SHRIMP	..	..	..	..
TOTAL CATCH (KG)	132	373	2861	1600

Appendix Table 1 (cont'd)

HAUL NUMBER		37	38	39
DATE		AUG 24	AUG 24	AUG 25
AREA (MAJOR, MINOR)		3C,23	3C,23	3C,23
START TIME	PST)	14:35	18:23	7:58
DURATION	(MIN)	55	27	9
START N. LAT.	(DEG)	48	48	48
	(MIN)	34.0	39.7	50.7
W. LONG	(DEG)	125	125	125
	(MIN)	38.8	35.6	9.5
FINISH N. LAT.	(DEG)	48	48	48
	(MIN)	34.7	39.5	50.9
W. LONG	(DEG)	125	125	125
	(MIN)	39.4	37.8	9.2
HAUL DISTANCE	(KM)	2.8	2.6	1.5
	(N MI)	1.5	1.4	0.8
DIRECTION (DEG.TRUE)		120	243	17
BOTTOM DEPTH	(M)	66- 62	232- 139	82- 93
	(FM)	36- 34	127- 76	45- 51
MODAL DEPTH	(M)	64	185	87
NET/GEAR DEPTH	(M)	44- 40	150- 128	37- 37
	(FM)	24- 22	82- 70	20- 20
MODAL NET DEPTH	(M)	42	139	37
GEAR TYPE		222	222	222
TOTAL CATCH	(KG)	250	806	5478
REMARKS		USABLE	USABLE	USABLE

Appendix Table 1 (cont'd)

HAUL NUMBER	37	38	39
DATE	AUG 24	AUG 24	AUG 25
AREA (MAJOR, MINOR)	3C,23	3C,23	3C,23
ARROWTOOTH FLOUNDER	..	..	..
DOVER SOLE	..	..	..
ENGLISH SOLE	..	..	..
FLATHEAD SOLE	..	..	..
PACIFIC HALIBUT	..	..	..
PETRALE SOLE	..	..	..
REX SOLE	..	..	..
S. ALEUTIANUS	..	..	..
S. ALUTUS	..	..	..
S. BABCOCKI	..	..	..
S. BREVISPINIS	..	..	..
S. CRAMERI	..	..	..
S. DIPLOPROA	..	..	..
S. ELONGATUS	..	..	..
S. ENTOMELAS	..	..	..
S. FLAVIDUS	..	..	..
S. PAUCISPINIS	..	..	..
S. PINNIGER	..	..	..
S. PRORIGER	..	..	..
S. REEDI	..	..	..
S. RUBERRIMUS	..	..	..
S. ZACENTRUS	..	..	..
SEB. ALASCANUS	..	..	..
AMERICAN SHAD	..	..	..
CHINOOK SALMON	57	..	..
COHO SALMON	..	..	..
EULACHON	..	..	..
LINGCOD	..	..	..
NORTHERN ANCHOVY	..	..	..
PACIFIC COD	..	..	..
PACIFIC HAKE	..	795	5455
PACIFIC HERRING	91	..	..
PACIFIC TOMCOD	..	..	..
PINK SALMON	..	..	..
SABLEFISH	..	..	..
WALLEYE POLLOCK	..	9	23
PACIFIC ELECTRIC RAY	..	..	..
RATFISH	..	..	..
SPINY DOGFISH	102	2	..
OPAL SQUID	..	..	..
PINK SHRIMP	..	..	..
SIDESTRIPE SHRIMP	..	..	..
TOTAL CATCH (KG)	250	806	5478

Footnotes to Appendix Table 1

Area:	Major area	3C	Southwest Vancouver Island
	"	3C	Northwest Vancouver Island
	Minor area	21	Swiftsure Bank
		23	La Pérouse Bank
		24	Sidney Inlet
		25	Nootka Sound to Tahsis Inlet
PST:			Pacific Standard Time
Gear type:		100	Bottom trawl
		222	Midwater trawl
Total catch:			Total catch weight in kilograms

Appendix Table 2. Pacific hake length frequency. F/V CALEDONIAN, August 12-25, 1986.

SET NO.	1			3			4			5		
FORK LENGTH (CM)	M	F	T	M	F	T	M	F	T	M	F	T
16	-	-	-	-	-	-	-	-	-	-	-	-
17	-	-	-	-	-	-	-	-	-	-	-	-
18	-	-	-	-	-	-	-	-	-	-	-	-
19	-	-	-	-	-	-	-	-	-	-	-	-
20	-	-	-	-	-	-	-	-	-	-	-	-
21	-	-	-	-	-	-	-	-	-	-	-	-
22	-	-	-	-	-	-	-	-	-	-	-	-
23	-	-	-	-	-	-	-	-	-	-	-	-
24	-	-	-	-	-	-	-	-	-	-	-	-
25	-	-	-	-	-	-	-	-	-	-	-	-
26	-	-	-	-	-	-	-	-	-	-	-	-
27	-	-	-	-	-	-	-	-	-	-	-	-
28	-	-	-	-	-	-	-	-	-	-	-	-
29	-	-	-	-	-	-	-	-	-	-	-	-
30	-	1	1	-	-	-	-	-	-	-	-	-
31	-	0	0	-	-	-	-	-	-	-	-	-
32	-	0	0	-	-	-	-	-	-	-	-	-
33	-	0	0	-	-	-	-	-	-	-	-	-
34	-	0	0	-	-	-	-	-	-	-	-	-
35	-	0	0	-	-	-	-	-	-	-	-	-
36	-	0	0	-	-	-	-	-	-	-	-	-
37	-	0	0	-	-	-	-	-	-	-	-	-
38	-	0	0	-	-	-	-	-	-	-	-	-
39	-	0	0	-	-	-	-	-	-	-	-	-
40	-	0	0	-	-	-	-	-	-	-	-	-
41	-	0	0	-	-	-	-	-	-	-	-	-
42	-	0	0	1	-	1	-	-	-	-	-	-
43	-	0	0	0	-	0	-	-	-	1	-	1
44	-	0	0	0	1	1	-	1	1	0	-	0
45	-	0	0	1	3	4	-	0	0	1	-	1
46	-	0	0	0	0	0	-	1	1	0	-	0
47	-	0	0	0	5	5	3	3	6	0	3	3
48	-	0	0	1	0	1	0	2	2	0	2	2
49	-	0	0	0	0	0	0	1	1	1	0	1
50	-	0	0	0	2	2	2	0	2	0	1	1
51	-	0	0	0	1	1	-	1	1	1	0	1
52	-	0	0	0	0	0	-	0	0	1	1	2
53	-	1	1	0	0	0	-	1	1	-	1	1
54	-	0	0	0	1	1	-	2	2	-	0	0
55	1	0	1	1	1	2	-	0	0	-	1	1
56	-	0	0	-	0	0	-	0	0	-	0	0
57	-	0	0	-	0	0	-	0	0	-	0	0
58	-	0	0	-	0	0	-	1	1	-	1	1

Appendix Table 2 (cont'd)

SET NO.	1			3			4			5		
FORK LENGTH (CM)	M	F	T	M	F	T	M	F	T	M	F	T
59	-	0	0	-	0	0	-	1	1	-	0	0
60	-	0	0	-	0	0	-	1	1	-	0	0
61	-	0	0	-	0	0	-	0	0	-	1	1
62	-	1	1	-	0	0	-	0	0	-	-	-
63	-	-	-	-	0	0	-	0	0	-	-	-
64	-	-	-	-	0	0	-	0	0	-	-	-
65	-	-	-	-	0	0	-	0	0	-	-	-
66	-	-	-	-	1	1	-	0	0	-	-	-
67	-	-	-	-	-	-	-	1	1	-	-	-
68	-	-	-	-	-	-	-	-	-	-	-	-
69	-	-	-	-	-	-	-	-	-	-	-	-
70	-	-	-	-	-	-	-	-	-	-	-	-
71	-	-	-	-	-	-	-	-	-	-	-	-
72	-	-	-	-	-	-	-	-	-	-	-	-
73	-	-	-	-	-	-	-	-	-	-	-	-
74	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	1	3	4	4	15	19	5	16	21	5	11	16

Appendix Table 2 (cont'd)

SET NO. FORK LENGTH (CM)	6			7			9			10		
	M	F	T	M	F	T	M	F	T	M	F	T
16	-	-	-	-	-	-	-	-	-	-	-	-
17	-	-	-	-	-	-	-	-	-	-	-	-
18	-	-	-	-	-	-	-	-	-	-	-	-
19	-	-	-	-	-	-	-	-	-	-	-	-
20	-	-	-	-	-	-	-	-	-	-	-	-
21	-	-	-	-	-	-	-	-	-	-	-	-
22	-	-	-	-	-	-	-	-	-	-	-	-
23	-	-	-	-	-	-	-	-	-	-	-	-
24	-	-	-	-	-	-	-	-	-	-	-	-
25	-	-	-	-	-	-	-	-	-	-	-	-
26	-	-	-	-	-	-	-	-	-	-	-	-
27	-	-	-	-	-	-	-	-	-	-	-	-
28	-	-	-	-	-	-	-	-	-	-	-	-
29	-	-	-	-	-	-	-	-	-	-	-	-
30	-	-	-	-	-	-	-	-	-	-	-	-
31	-	-	-	-	-	-	-	-	-	-	-	-
32	-	-	-	-	-	-	-	-	-	-	-	-
33	-	-	-	-	-	-	-	-	-	-	-	-
34	-	-	-	-	-	-	-	-	-	-	-	-
35	-	-	-	-	-	-	-	-	-	-	-	-
36	-	-	-	-	-	-	-	-	-	-	-	-
37	-	-	-	-	-	-	-	-	-	-	-	-
38	-	-	-	-	-	-	-	-	-	-	-	-
39	-	-	-	-	-	-	1	-	1	-	-	-
40	-	-	-	-	-	-	1	-	1	-	-	-
41	-	-	-	-	-	-	0	-	0	-	-	-
42	-	-	-	-	-	-	3	-	3	-	-	-
43	-	1	1	-	-	-	7	8	15	1	1	2
44	2	3	5	-	-	-	9	7	16	3	4	7
45	2	4	6	-	1	1	10	14	24	2	3	5
46	2	1	3	1	3	4	10	13	23	3	4	7
47	4	1	5	0	-	0	6	16	22	2	0	2
48	1	2	3	1	-	1	9	13	22	2	6	8
49	1	0	1	-	-	-	4	5	9	0	2	2
50	1	1	2	-	-	-	4	8	12	2	2	4
51	-	1	1	-	-	-	2	3	5	1	0	1
52	-	0	0	-	-	-	-	2	2	2	2	4
53	-	0	0	-	-	-	-	2	2	1	1	2
54	-	0	0	-	-	-	-	0	0	-	1	1
55	-	1	1	-	-	-	-	1	1	-	3	3
56	-	0	0	-	-	-	-	-	-	-	1	1
57	-	1	1	-	-	-	-	-	-	-	0	0
58	-	0	0	-	-	-	-	-	-	-	1	1

Appendix Table 2 (cont'd)

SET NO.	6			7			9			10		
FORK LENGTH (CM)	M	F	T	M	F	T	M	F	T	M	F	T
59	-	1	1	-	-	-	-	-	-	-	1	1
60	-	-	-	-	-	-	-	-	-	-	-	-
61	-	-	-	-	-	-	-	-	-	-	-	-
62	-	-	-	-	-	-	-	-	-	-	-	-
63	-	-	-	-	-	-	-	-	-	-	-	-
64	-	-	-	-	-	-	-	-	-	-	-	-
65	-	-	-	-	-	-	-	-	-	-	-	-
66	-	-	-	-	-	-	-	-	-	-	-	-
67	-	-	-	-	-	-	-	-	-	-	-	-
68	-	-	-	-	-	-	-	-	-	-	-	-
69	-	-	-	-	-	-	-	-	-	-	-	-
70	-	-	-	-	-	-	-	-	-	-	-	-
71	-	-	-	-	-	-	-	-	-	-	-	-
72	-	-	-	-	-	-	-	-	-	-	-	-
73	-	-	-	-	-	-	-	-	-	-	-	-
74	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	13	17	30	2	4	6	66	92	158	19	32	51

Appendix Table 2 (cont'd)

SET NO. FORK LENGTH (CM)	11			12			14			15		
	M	F	T	M	F	T	M	F	T	M	F	T
16	-	-	-	-	-	-	-	-	-	-	-	-
17	-	-	-	-	-	-	-	-	-	-	-	-
18	-	-	-	-	-	-	-	-	-	-	-	-
19	-	-	-	-	-	-	-	-	-	-	-	-
20	-	-	-	-	-	-	-	-	-	-	-	-
21	-	-	-	-	-	-	-	-	-	-	-	-
22	-	-	-	-	-	-	-	-	-	-	-	-
23	-	-	-	-	-	-	-	-	-	-	-	-
24	-	-	-	-	-	-	-	-	-	-	-	-
25	-	-	-	-	-	-	-	-	-	-	-	-
26	-	-	-	-	-	-	-	-	-	-	-	-
27	-	-	-	-	-	-	-	-	-	-	-	-
28	-	-	-	-	-	-	-	-	-	-	-	-
29	-	-	-	-	-	-	-	-	-	-	-	-
30	-	-	-	-	-	-	-	-	-	-	-	-
31	-	-	-	-	-	-	-	1	1	-	-	-
32	-	-	-	-	-	-	-	0	0	-	-	-
33	-	-	-	-	-	-	-	0	0	-	-	-
34	-	-	-	-	-	-	-	0	0	-	-	-
35	-	-	-	-	-	-	-	0	0	-	-	-
36	-	-	-	-	-	-	-	0	0	-	-	-
37	-	-	-	-	-	-	-	0	0	-	-	-
38	-	-	-	-	-	-	-	0	0	-	-	-
39	-	-	-	-	1	1	-	1	1	-	-	-
40	-	-	-	-	0	0	-	1	1	-	-	-
41	-	-	-	-	0	0	-	1	1	-	-	-
42	-	-	-	-	0	0	-	0	0	4	1	5
43	-	-	-	-	1	1	-	0	0	11	4	15
44	-	-	-	1	1	2	-	1	1	16	16	32
45	-	-	-	2	3	5	-	1	1	13	21	34
46	-	-	-	4	4	8	3	8	11	15	18	33
47	-	1	1	5	5	10	7	11	18	8	8	16
48	1	0	1	3	7	10	10	18	28	6	8	14
49	-	0	0	3	5	8	7	18	25	6	9	15
50	-	1	1	4	7	11	10	21	31	7	6	13
51	-	1	1	3	5	8	7	8	15	6	7	13
52	-	3	3	3	0	3	7	19	26	3	8	11
53	-	1	1	1	4	5	7	15	22	1	4	5
54	-	4	4	0	2	2	3	11	14	1	3	4
55	-	1	1	1	3	4	3	10	13	1	1	2
56	-	0	0	-	1	1	2	9	11	0	5	5
57	-	1	1	-	3	3	1	3	4	0	0	0
58	-	1	1	-	1	1	-	1	1	1	0	1

Appendix Table 2 (cont'd)

SET NO.	11			12			14			15		
FORK LENGTH (CM)	M	F	T	M	F	T	M	F	T	M	F	T
59	-	0	0	-	1	1	-	3	3	-	0	0
60	-	0	0	-	2	2	-	1	1	-	1	1
61	-	0	0	-	1	1	-	3	3	-	-	-
62	-	0	0	-	-	-	-	0	0	-	-	-
63	-	0	0	-	-	-	-	0	0	-	-	-
64	-	0	0	-	-	-	-	0	0	-	-	-
65	-	0	0	-	-	-	-	0	0	-	-	-
66	-	1	1	-	-	-	-	0	0	-	-	-
67	-	0	0	-	-	-	-	1	1	-	-	-
68	-	0	0	-	-	-	-	-	-	-	-	-
69	-	0	0	-	-	-	-	-	-	-	-	-
70	-	0	0	-	-	-	-	-	-	-	-	-
71	-	1	1	-	-	-	-	-	-	-	-	-
72	-	-	-	-	-	-	-	-	-	-	-	-
73	-	-	-	-	-	-	-	-	-	-	-	-
74	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	1	16	17	30	57	87	67	166	233	99	120	219

Appendix Table 2 (cont'd)

SET NO. FORK LENGTH (CM)	16			18			19			20		
	M	F	T	M	F	T	M	F	T	M	F	T
16	–	–	–	–	–	–	1	–	1	–	–	–
17	–	–	–	–	–	–	1	–	1	–	–	–
18	–	–	–	–	–	–	3	2	5	–	–	–
19	–	–	–	–	–	–	2	11	13	–	–	–
20	–	–	–	–	–	–	10	12	22	–	–	–
21	–	–	–	–	–	–	11	12	23	–	–	–
22	–	–	–	–	–	–	16	6	22	–	–	–
23	–	–	–	–	–	–	4	2	6	–	–	–
24	–	–	–	–	–	–	1	0	1	–	–	–
25	–	–	–	–	–	–	0	0	0	–	–	–
26	–	–	–	–	–	–	0	0	0	–	–	–
27	–	–	–	–	–	–	0	0	0	–	–	–
28	–	–	–	–	–	–	0	1	1	–	–	–
29	–	–	–	–	–	–	1	0	1	–	–	–
30	–	–	–	–	–	–	0	0	0	–	–	–
31	1	–	1	–	–	–	1	1	2	–	–	–
32	0	–	0	–	–	–	1	0	1	–	–	–
33	0	–	0	–	–	–	0	0	0	–	–	–
34	0	–	0	1	–	1	0	0	0	–	–	–
35	1	–	1	4	–	4	1	0	1	–	–	–
36	1	–	1	3	1	4	–	0	0	–	–	–
37	1	1	2	6	4	10	–	0	0	–	–	–
38	0	2	2	11	7	18	–	0	0	–	–	–
39	0	0	0	11	11	22	–	1	1	–	–	–
40	0	1	1	13	10	23	–	2	2	–	–	–
41	0	0	0	13	11	24	–	1	1	–	–	–
42	0	0	0	11	13	24	–	0	0	–	–	–
43	1	1	2	4	5	9	–	0	0	1	–	1
44	1	0	1	4	9	13	–	0	0	0	1	1
45	1	1	2	4	3	7	–	0	0	1	2	3
46	1	1	2	3	7	10	–	0	0	0	4	4
47	2	0	2	1	1	2	–	0	0	2	0	2
48	–	1	1	1	1	2	–	0	0	2	3	5
49	–	1	1	–	1	1	–	0	0	0	2	2
50	–	0	0	–	2	2	–	0	0	4	5	9
51	–	1	1	–	1	1	–	0	0	3	8	11
52	–	1	1	–	1	1	–	0	0	4	6	10
53	–	1	1	–	–	–	–	0	0	3	12	15
54	–	0	0	–	–	–	–	0	0	1	7	8
55	–	0	0	–	–	–	–	0	0	3	15	18
56	–	0	0	–	–	–	–	0	0	0	13	13
57	–	1	1	–	–	–	–	0	0	2	9	11
58	–	0	0	–	–	–	–	0	0	0	10	10

Appendix Table 2 (cont'd)

SET NO.	16			18			19			20		
FORK LENGTH (CM)	M	F	T	M	F	T	M	F	T	M	F	T
59	–	0	0	–	–	–	–	0	0	0	2	2
60	–	0	0	–	–	–	–	0	0	2	1	3
61	–	0	0	–	–	–	–	0	0	–	5	5
62	–	0	0	–	–	–	–	0	0	–	2	2
63	–	0	0	–	–	–	–	0	0	–	0	0
64	–	0	0	–	–	–	–	1	1	–	1	1
65	–	0	0	–	–	–	–	–	–	–	0	0
66	–	1	1	–	–	–	–	–	–	–	1	1
67	–	–	–	–	–	–	–	–	–	–	1	1
68	–	–	–	–	–	–	–	–	–	–	1	1
69	–	–	–	–	–	–	–	–	–	–	–	–
70	–	–	–	–	–	–	–	–	–	–	–	–
71	–	–	–	–	–	–	–	–	–	–	–	–
72	–	–	–	–	–	–	–	–	–	–	–	–
73	–	–	–	–	–	–	–	–	–	–	–	–
74	–	–	–	–	–	–	–	–	–	–	–	–
TOTAL	10	14	24	90	88	178	53	52	105	28	111	139

Appendix Table 2 (cont'd)

SET NO.	21			25			26			27		
FORK LENGTH (CM)	M	F	T	M	F	T	M	F	T	M	F	T
16	-	-	-	-	-	-	-	-	-	-	-	-
17	-	-	-	-	-	-	-	-	-	-	-	-
18	-	-	-	-	-	-	-	-	-	-	-	-
19	-	-	-	-	-	-	-	-	-	-	-	-
20	-	-	-	-	-	-	-	-	-	-	-	-
21	-	-	-	-	-	-	-	-	-	-	-	-
22	-	-	-	-	-	-	-	-	-	-	-	-
23	-	-	-	-	-	-	-	-	-	-	-	-
24	-	-	-	-	-	-	-	-	-	-	-	-
25	-	-	-	-	-	-	-	-	-	-	-	-
26	-	-	-	-	-	-	-	-	-	-	-	-
27	-	-	-	-	-	-	-	-	-	-	-	-
28	-	-	-	-	-	-	-	-	-	-	-	-
29	-	-	-	-	-	-	-	-	-	-	-	-
30	-	-	-	-	-	-	-	-	-	-	-	-
31	-	-	-	-	-	-	-	-	-	-	-	-
32	-	-	-	-	-	-	-	-	-	-	-	-
33	-	-	-	-	-	-	-	-	-	-	-	-
34	-	-	-	-	-	-	-	-	-	-	-	-
35	-	-	-	-	-	-	-	-	-	-	-	-
36	-	1	1	-	-	-	-	-	-	-	-	-
37	1	0	1	-	-	-	-	-	-	-	-	-
38	0	0	0	-	-	-	-	-	-	-	-	-
39	0	0	0	-	-	-	-	-	-	-	-	-
40	0	0	0	-	-	-	-	-	-	-	1	1
41	1	0	1	-	-	-	-	-	-	-	0	0
42	0	0	0	-	-	-	2	3	5	2	0	2
43	2	0	2	1	1	2	5	3	8	3	1	4
44	8	3	11	2	2	4	12	9	21	9	8	17
45	8	8	16	6	13	19	17	14	31	6	9	15
46	12	11	23	11	11	22	9	15	24	6	11	17
47	9	13	22	2	12	14	11	14	25	7	11	18
48	7	9	16	10	6	16	5	12	17	4	6	10
49	4	7	11	13	8	21	5	4	9	5	14	19
50	5	9	14	7	10	17	5	4	9	5	8	13
51	4	7	11	8	10	18	1	3	4	1	9	10
52	3	6	9	6	8	14	1	2	3	0	4	4
53	4	7	11	4	9	13	0	4	4	2	2	4
54	2	3	5	3	7	10	0	-	0	2	1	3
55	3	3	6	0	4	4	1	-	1	1	0	1
56	1	1	2	2	4	6	1	-	1	0	0	0
57	-	2	2	-	2	2	-	-	-	0	0	0
58	-	1	1	-	3	3	-	-	-	0	0	0

Appendix Table 2 (cont'd)

SET NO.	21			25			26			27		
FORK LENGTH (CM)	M	F	T	M	F	T	M	F	T	M	F	T
59	-	2	2	-	0	0	-	-	-	0	1	1
60	-	3	3	-	0	0	-	-	-	1	-	1
61	-	1	1	-	0	0	-	-	-	-	-	-
62	-	-	-	-	1	1	-	-	-	-	-	-
63	-	-	-	-	0	0	-	-	-	-	-	-
64	-	-	-	-	1	1	-	-	-	-	-	-
65	-	-	-	-	-	-	-	-	-	-	-	-
66	-	-	-	-	-	-	-	-	-	-	-	-
67	-	-	-	-	-	-	-	-	-	-	-	-
68	-	-	-	-	-	-	-	-	-	-	-	-
69	-	-	-	-	-	-	-	-	-	-	-	-
70	-	-	-	-	-	-	-	-	-	-	-	-
71	-	-	-	-	-	-	-	-	-	-	-	-
72	-	-	-	-	-	-	-	-	-	-	-	-
73	-	-	-	-	-	-	-	-	-	-	-	-
74	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	74	97	171	75	112	187	75	87	162	54	86	140

Appendix Table 2 (cont'd)

SET NO.	28			29			32			33		
FORK LENGTH (CM)	M	F	T	M	F	T	M	F	T	M	F	T
16	-	-	-	-	-	-	-	-	-	-	-	-
17	-	-	-	-	-	-	-	-	-	-	-	-
18	-	-	-	-	-	-	-	-	-	-	-	-
19	-	-	-	-	-	-	-	-	-	-	-	-
20	-	-	-	-	-	-	-	-	-	-	-	-
21	-	-	-	-	-	-	-	-	-	-	-	-
22	-	-	-	-	-	-	-	-	-	-	-	-
23	-	-	-	-	-	-	-	-	-	-	-	-
24	-	-	-	-	-	-	-	-	-	-	-	-
25	-	-	-	-	-	-	-	-	-	-	-	-
26	-	-	-	-	-	-	-	-	-	-	-	-
27	-	-	-	-	-	-	-	-	-	-	-	-
28	-	-	-	-	-	-	-	-	-	-	-	-
29	-	-	-	-	-	-	-	-	-	-	-	-
30	-	-	-	-	-	-	-	-	-	-	-	-
31	-	-	-	-	-	-	-	-	-	-	-	-
32	-	-	-	-	-	-	-	-	-	-	-	-
33	-	-	-	-	-	-	-	-	-	-	-	-
34	-	-	-	-	-	-	-	-	-	-	-	-
35	-	-	-	-	-	-	-	-	-	-	-	-
36	-	-	-	-	-	-	-	-	-	-	-	-
37	-	-	-	-	-	-	-	-	-	-	-	-
38	-	-	-	-	-	-	-	-	-	-	-	-
39	-	-	-	-	-	-	-	-	-	-	-	-
40	-	-	-	-	-	-	-	-	-	-	-	-
41	3	-	3	-	1	1	-	-	-	-	-	-
42	2	1	3	3	2	5	2	2	4	-	1	1
43	5	2	7	9	2	11	5	0	5	3	3	6
44	9	8	17	16	4	20	8	6	14	5	8	13
45	17	15	32	13	17	30	11	7	18	3	9	12
46	11	12	23	13	14	27	10	7	17	3	9	12
47	10	18	28	7	14	21	8	12	20	5	13	18
48	5	6	11	6	10	16	10	18	28	3	6	9
49	8	5	13	3	5	8	7	8	15	2	8	10
50	4	9	13	5	3	8	8	7	15	3	1	4
51	3	1	4	3	6	9	0	4	4	1	9	10
52	3	3	6	2	3	5	2	7	9	0	4	4
53	-	1	1	3	1	4	3	5	8	2	3	5
54	-	3	3	-	3	3	0	2	2	-	1	1
55	-	0	0	-	3	3	1	3	4	-	3	3
56	-	1	1	-	-	-	0	2	2	-	1	1
57	-	0	0	-	-	-	1	-	1	-	0	0
58	-	0	0	-	-	-	-	-	-	-	1	1

Appendix Table 2 (cont'd)

SET NO.	28			29			32			33		
FORK LENGTH (CM)	M	F	T	M	F	T	M	F	T	M	F	T
59	-	0	0	-	-	-	-	-	-	-	-	-
60	-	0	0	-	-	-	-	-	-	-	-	-
61	-	0	0	-	-	-	-	-	-	-	-	-
62	-	0	0	-	-	-	-	-	-	-	-	-
63	-	0	0	-	-	-	-	-	-	-	-	-
64	-	0	0	-	-	-	-	-	-	-	-	-
65	-	1	1	-	-	-	-	-	-	-	-	-
66	-	-	-	-	-	-	-	-	-	-	-	-
67	-	-	-	-	-	-	-	-	-	-	-	-
68	-	-	-	-	-	-	-	-	-	-	-	-
69	-	-	-	-	-	-	-	-	-	-	-	-
70	-	-	-	-	-	-	-	-	-	-	-	-
71	-	-	-	-	-	-	-	-	-	-	-	-
72	-	-	-	-	-	-	-	-	-	-	-	-
73	-	-	-	-	-	-	-	-	-	-	-	-
74	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	80	86	166	83	88	171	76	90	166	30	80	110

Appendix Table 2 (cont'd)

SET NO.	34			35			36			38		
FORK LENGTH (CM)	M	F	T	M	F	T	M	F	T	M	F	T
16	-	-	-	-	-	-	-	-	-	-	-	-
17	-	-	-	-	-	-	-	-	-	-	-	-
18	-	-	-	-	-	-	-	-	-	-	-	-
19	-	-	-	-	-	-	-	-	-	-	-	-
20	-	-	-	-	-	-	-	-	-	-	-	-
21	-	-	-	-	-	-	-	-	-	-	-	-
22	-	-	-	-	-	-	-	-	-	-	-	-
23	-	-	-	-	-	-	-	-	-	-	-	-
24	-	-	-	-	-	-	-	-	-	-	-	-
25	-	-	-	-	-	-	-	-	-	-	-	-
26	-	-	-	-	-	-	-	-	-	-	-	-
27	-	-	-	-	-	-	-	-	-	-	-	-
28	-	-	-	-	-	-	-	-	-	-	-	-
29	-	-	-	-	-	-	-	-	-	-	-	-
30	-	-	-	-	-	-	-	-	-	-	-	-
31	-	-	-	-	-	-	-	-	-	-	-	-
32	-	-	-	-	-	-	-	-	-	-	-	-
33	-	-	-	-	-	-	-	-	-	-	-	-
34	-	-	-	-	-	-	-	-	-	-	-	-
35	-	-	-	-	-	-	-	-	-	-	-	-
36	-	-	-	-	-	-	-	-	-	-	-	-
37	-	-	-	-	-	-	-	-	-	-	-	-
38	-	-	-	-	-	-	-	1	1	-	-	-
39	-	-	-	-	-	-	-	0	0	1	-	1
40	-	-	-	-	-	-	-	0	0	0	-	0
41	1	-	1	-	1	1	-	0	0	0	-	0
42	1	2	3	-	0	0	-	1	1	1	-	1
43	1	3	4	7	7	14	-	0	0	0	-	0
44	10	6	16	7	8	15	-	0	0	1	1	2
45	16	9	25	15	14	29	3	4	7	6	4	10
46	7	13	20	16	10	26	1	3	4	5	3	8
47	12	14	26	10	13	23	2	5	7	7	7	14
48	5	11	16	6	13	19	2	6	8	6	8	14
49	6	6	12	3	6	9	1	10	11	11	6	17
50	7	8	15	5	9	14	8	15	23	2	6	8
51	5	5	10	2	5	7	5	14	19	2	10	12
52	2	5	7	1	3	4	3	14	17	5	7	12
53	3	0	3	0	2	2	14	12	26	2	4	6
54	-	2	2	1	0	1	4	11	15	0	0	0
55	-	2	2	-	0	0	1	10	11	3	2	5
56	-	0	0	-	1	1	1	8	9	-	2	2
57	-	1	1	-	1	1	2	9	11	-	2	2
58	-	0	0	-	0	0	-	2	2	-	1	1

Appendix Table 2 (cont'd)

SET NO.	34			35			36			38		
FORK LENGTH (CM)	M	F	T	M	F	T	M	F	T	M	F	T
59	-	0	0	-	0	0	-	2	2	-	0	0
60	-	3	3	-	0	0	-	0	0	-	1	1
61	-	0	0	-	0	0	-	2	2	-	0	0
62	-	1	1	-	0	0	-	0	0	-	0	0
63	-	-	-	-	0	0	-	0	0	-	0	0
64	-	-	-	-	1	1	-	0	0	-	0	0
65	-	-	-	-	-	-	-	0	0	-	1	1
66	-	-	-	-	-	-	-	0	0	-	0	0
67	-	-	-	-	-	-	-	0	0	-	0	0
68	-	-	-	-	-	-	-	0	0	-	0	0
69	-	-	-	-	-	-	-	1	1	-	0	0
70	-	-	-	-	-	-	-	-	-	-	1	1
71	-	-	-	-	-	-	-	-	-	-	-	-
72	-	-	-	-	-	-	-	-	-	-	-	-
73	-	-	-	-	-	-	-	-	-	-	-	-
74	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	76	91	167	73	94	167	47	130	177	52	66	118

Appendix Table 2 (cont'd)

SET NO. FORK LENGTH (CM)	39			TOTAL		
	M	F	T	M	F	T
16	-	-	-	1	-	1
17	-	-	-	1	-	1
18	-	-	-	3	2	5
19	-	-	-	2	11	13
20	-	-	-	10	12	22
21	-	-	-	11	12	23
22	-	-	-	16	6	22
23	-	-	-	4	2	6
24	-	-	-	1	0	1
25	-	-	-	0	0	0
26	-	-	-	0	0	0
27	-	-	-	0	0	0
28	-	-	-	0	1	1
29	-	-	-	1	0	1
30	-	1	1	0	2	2
31	-	0	0	2	2	4
32	5	2	7	6	2	8
33	12	2	14	12	2	14
34	17	1	18	18	1	19
35	22	24	46	28	24	52
36	25	31	56	29	33	62
37	17	23	40	25	28	53
38	10	9	19	21	19	40
39	13	12	25	26	26	52
40	6	6	12	20	21	41
41	2	2	4	20	17	37
42	2	3	5	34	29	63
43	0	1	1	67	44	111
44	0	0	0	123	107	230
45	0	1	1	158	180	338
46	0	2	2	146	185	331
47	0	1	1	130	201	331
48	1	0	1	107	174	281
49	1	0	1	91	131	222
50	0	0	0	98	145	243
51	0	1	1	58	121	179
52	1	0	1	49	109	158
53	-	0	0	50	93	143
54	-	0	0	17	64	81
55	-	1	1	20	68	88
56	-	1	1	7	50	57
57	-	0	0	6	35	41
58	-	0	0	1	24	25

Appendix Table 2 (cont'd)

SET NO. FORK LENGTH (CM)	39			TOTAL		
	M	F	T	M	F	T
59	-	0	0	0	14	14
60	-	0	0	3	13	16
61	-	0	0	-	13	13
62	-	0	0	-	5	5
63	-	0	0	-	0	0
64	-	0	0	-	4	4
65	-	0	0	-	2	2
66	-	0	0	-	4	4
67	-	0	0	-	3	3
68	-	3	3	-	4	4
69	-	1	1	-	2	2
70	-	1	1	-	2	2
71	-	0	0	-	1	1
72	-	0	0	-	0	0
73	-	0	0	-	0	0
74	-	1	1	-	1	1
TOTAL	134	130	264	1422	2051	3473

Appendix Table 3. Sablefish length frequency. F/V CALEDONIAN, August 12-25, 1986.

SET NO.	1			3			4			5		
FORK LENGTH (CM)	M	F	T	M	F	T	M	F	T	M	F	T
35	-	-	-	-	-	-	-	-	-	-	-	-
36	-	-	-	-	-	-	-	-	-	-	-	-
37	-	-	-	-	-	-	-	-	-	-	-	-
38	-	-	-	-	-	-	-	-	-	-	-	-
39	-	-	-	-	-	-	-	-	-	-	-	-
40	-	-	-	-	-	-	-	-	-	-	-	-
41	-	-	-	-	-	-	-	-	-	1	-	1
42	-	-	-	-	-	-	-	-	-	0	-	0
43	-	-	-	-	-	-	1	-	1	0	-	0
44	-	-	-	-	-	-	0	-	0	0	1	1
45	1	-	1	-	-	-	0	-	0	0	0	0
46	1	1	2	1	-	1	0	-	0	0	0	0
47	2	0	2	0	-	0	0	-	0	0	1	1
48	1	0	1	0	-	0	0	-	0	2	0	2
49	1	0	1	0	1	1	1	-	1	1	1	2
50	1	0	1	0	0	0	0	-	0	0	0	0
51	2	1	3	0	0	0	0	-	0	0	0	0
52	1	0	1	0	0	0	0	-	0	0	1	1
53	2	0	2	0	0	0	0	-	0	0	0	0
54	0	0	0	0	0	0	0	-	0	0	0	0
55	1	0	1	2	0	2	0	-	0	0	0	0
56	1	1	2	0	0	0	0	-	0	2	2	4
57	0	0	0	1	0	1	0	-	0	0	0	0
58	1	0	1	2	0	2	0	-	0	0	1	1
59	0	0	0	3	1	4	0	-	0	1	0	1
60	0	0	0	0	0	0	1	-	1	1	0	1
61	0	0	0	2	1	3	0	-	0	0	1	1
62	0	0	0	1	1	2	0	-	0	0	0	0
63	2	0	2	2	0	2	1	-	1	0	0	0
64	0	1	1	3	0	3	0	-	0	0	1	1
65	2	0	2	5	0	5	0	-	0	0	0	0
66	0	0	0	0	1	1	0	-	0	0	0	0
67	0	1	1	1	1	2	0	1	1	0	0	0
68	0	0	0	1	3	4	0	1	1	0	1	1
69	1	0	1	0	1	1	0	0	0	1	-	1
70	-	0	0	0	1	1	0	0	0	0	-	0
71	-	0	0	1	1	2	0	0	0	0	-	0
72	-	1	1	-	0	0	0	1	1	0	-	0
73	-	0	0	-	0	0	1	0	1	0	-	0
74	-	2	2	-	0	0	-	1	1	1	-	1
75	-	1	1	-	0	0	-	-	-	-	-	-
76	-	-	-	-	0	0	-	-	-	-	-	-
77	-	-	-	-	0	0	-	-	-	-	-	-

Appendix Table 3 (cont'd)

SET NO.	1			3			4			5		
FORK LENGTH (CM)	M	F	T	M	F	T	M	F	T	M	F	T
78	-	-	-	-	0	0	-	-	-	-	-	-
79	-	-	-	-	0	0	-	-	-	-	-	-
80	-	-	-	-	0	0	-	-	-	-	-	-
81	-	-	-	-	0	0	-	-	-	-	-	-
82	-	-	-	-	1	1	-	-	-	-	-	-
83	-	-	-	-	1	1	-	-	-	-	-	-
TOTAL	20	9	29	25	14	39	5	4	9	10	10	20

Appendix Table 3 (cont'd)

SET NO. FORK LENGTH (CM)	6			7			8			9		
	M	F	T	M	F	T	M	F	T	M	F	T
35	-	-	-	-	-	-	-	-	-	-	-	-
36	-	-	-	-	-	-	-	-	-	-	-	-
37	-	-	-	-	-	-	-	-	-	1	-	1
38	-	-	-	-	-	-	-	-	-	0	-	0
39	-	-	-	-	-	-	-	-	-	1	1	2
40	-	-	-	-	-	-	-	-	-	0	0	0
41	-	-	-	-	-	-	-	-	-	1	0	1
42	-	-	-	-	-	-	-	-	-	0	0	0
43	-	-	-	-	-	-	-	-	-	0	0	0
44	-	-	-	-	-	-	-	-	-	1	0	1
45	-	-	-	-	-	-	1	-	1	1	0	1
46	-	-	-	-	-	-	0	-	0	2	0	2
47	-	-	-	-	-	-	0	-	0	2	0	2
48	-	-	-	-	-	-	0	-	0	1	0	1
49	-	-	-	-	-	-	0	-	0	1	0	1
50	-	-	-	-	-	-	0	-	0	0	0	0
51	-	-	-	1	-	1	0	-	0	0	0	0
52	-	-	-	0	-	0	0	-	0	0	0	0
53	-	-	-	0	-	0	1	-	1	0	0	0
54	-	-	-	0	-	0	0	-	0	0	0	0
55	-	-	-	0	-	0	0	-	0	0	0	0
56	-	-	-	0	-	0	1	-	1	0	0	0
57	-	-	-	0	-	0	0	-	0	0	0	0
58	-	-	-	0	-	0	0	-	0	0	0	0
59	-	-	-	0	-	0	1	-	1	1	0	1
60	1	-	1	1	-	1	2	-	2	-	0	0
61	0	-	0	-	-	0	1	-	1	-	0	0
62	1	1	2	-	-	0	0	-	0	-	0	0
63	0	-	0	-	-	0	1	-	1	-	0	0
64	1	-	1	-	-	0	-	-	0	-	0	0
65	-	-	-	-	-	0	-	-	0	-	0	0
66	-	-	-	-	-	0	-	-	0	-	0	0
67	-	-	-	-	-	0	-	-	0	-	0	0
68	-	-	-	-	-	0	-	-	0	-	1	1
69	-	-	-	-	-	0	-	-	0	-	-	-
70	-	-	-	-	-	0	-	-	0	-	-	-
71	-	-	-	-	-	0	-	-	0	-	-	-
72	-	-	-	-	-	0	-	1	1	-	-	-
73	-	-	-	-	-	0	-	-	-	-	-	-
74	-	-	-	-	-	0	-	-	-	-	-	-
75	-	-	-	-	1	1	-	-	-	-	-	-
76	-	-	-	-	-	-	-	-	-	-	-	-
77	-	-	-	-	-	-	-	-	-	-	-	-

Appendix Table 3 (cont'd)

SET NO.	6			7			8			9		
FORK LENGTH (CM)	M	F	T	M	F	T	M	F	T	M	F	T
78	-	-	-	-	-	-	-	-	-	-	-	-
79	-	-	-	-	-	-	-	-	-	-	-	-
80	-	-	-	-	-	-	-	-	-	-	-	-
81	-	-	-	-	-	-	-	-	-	-	-	-
82	-	-	-	-	-	-	-	-	-	-	-	-
83	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	3	1	4	2	1	3	8	1	9	12	2	14

Appendix Table 3 (cont'd)

SET NO. FORK LENGTH (CM)	10			11			12			13		
	M	F	T	M	F	T	M	F	T	M	F	T
35	–	–	–	–	–	–	–	–	–	1	1	2
36	–	–	–	–	–	–	–	–	–	2	2	4
37	–	–	–	–	–	–	–	–	–	5	0	5
38	–	–	–	–	–	–	–	–	–	3	5	8
39	–	–	–	–	–	–	–	–	–	3	1	4
40	–	–	–	–	–	–	–	–	–	3	1	4
41	–	–	–	–	–	–	–	–	–	1	0	1
42	–	–	–	–	–	–	–	–	–	0	1	1
43	–	–	–	–	–	–	–	–	–	0	0	0
44	–	–	–	–	–	–	–	–	–	0	0	0
45	–	–	–	–	–	–	–	–	–	1	1	2
46	–	–	–	1	–	1	–	–	–	1	0	1
47	–	–	–	0	–	0	–	–	–	2	0	2
48	–	–	–	0	–	0	–	–	–	3	0	3
49	–	–	–	0	–	0	–	–	–	1	1	2
50	–	–	–	0	–	0	–	–	–	2	1	3
51	–	–	–	0	–	0	–	–	–	0	0	0
52	–	–	–	0	–	0	–	–	–	0	1	1
53	–	–	–	0	–	0	–	–	–	0	–	0
54	–	–	–	0	–	0	–	–	–	0	–	0
55	–	–	–	0	–	0	–	1	1	1	–	1
56	–	–	–	1	–	1	1	1	2	0	–	0
57	–	–	–	0	–	0	0	0	0	1	–	1
58	1	–	1	0	–	0	0	1	1	–	–	–
59	–	–	0	0	–	0	1	1	2	–	–	–
60	–	–	0	1	–	1	0	1	1	–	–	–
61	–	–	0	1	–	1	1	1	2	–	–	–
62	–	–	0	0	–	0	0	2	2	–	–	–
63	–	–	0	1	–	1	0	1	1	–	–	–
64	–	–	0	1	1	2	0	0	0	–	–	–
65	–	–	0	1	0	1	1	0	1	–	–	–
66	–	–	0	–	0	0	1	2	3	–	–	–
67	–	–	0	–	0	0	1	1	2	–	–	–
68	–	1	1	–	0	0	2	1	3	–	–	–
69	–	0	0	–	0	0	1	2	3	–	–	–
70	–	0	0	–	0	0	–	1	1	–	–	–
71	–	0	0	–	0	0	–	1	1	–	–	–
72	–	1	1	–	0	0	–	1	1	–	–	–
73	–	–	–	–	0	0	–	1	1	–	–	–
74	–	–	–	–	2	2	–	1	1	–	–	–
75	–	–	–	–	0	0	–	0	0	–	–	–
76	–	–	–	–	0	0	–	1	1	–	–	–
77	–	–	–	–	0	0	–	–	–	–	–	–

Appendix Table 3 (cont'd)

SET NO. FORK LENGTH (CM)	10			11			12			13		
	M	F	T	M	F	T	M	F	T	M	F	T
78	-	-	-	-	1	1	-	-	-	-	-	-
79	-	-	-	-	1	1	-	-	-	-	-	-
80	-	-	-	-	2	2	-	-	-	-	-	-
81	-	-	-	-	0	0	-	-	-	-	-	-
82	-	-	-	-	0	0	-	-	-	-	-	-
83	-	-	-	-	1	1	-	-	-	-	-	-
TOTAL	1	2	3	7	8	15	9	21	30	30	15	45

Appendix Table 3 (cont'd)

SET NO. FORK LENGTH (CM)	TOTAL		
	M	F	T
35	1	1	2
36	2	2	4
37	6	0	6
38	3	5	8
39	4	2	6
40	3	1	4
41	3	0	3
42	0	1	1
43	1	0	1
44	1	1	2
45	4	1	5
46	6	1	7
47	6	1	7
48	7	0	7
49	5	3	8
50	3	1	4
51	3	1	4
52	1	2	3
53	3	0	3
54	0	0	0
55	4	1	5
56	6	4	10
57	2	0	2
58	4	2	6
59	7	2	9
60	7	1	8
61	5	3	8
62	2	4	6
63	7	1	8
64	5	3	8
65	9	0	9
66	1	3	4
67	2	4	6
68	3	8	11
69	3	3	6
70	0	2	2
71	1	2	3
72	0	5	5
73	1	1	2
74	1	6	7
75	-	2	2
76	-	1	1
77	-	0	0

Appendix Table 3 (cont'd)

SET NO. FORK LENGTH (CM)	TOTAL		
	M	F	T
78	-	1	1
79	-	1	1
80	-	2	2
81	-	0	0
82	-	1	1
83	-	2	2
TOTAL	132	88	220

Appendix Table 4. Spiny dogfish length frequency. F/V CALEDONIAN, August 12-25, 1986.

SET NO.	1			2			3			5		
TOTAL LENGTH (CM)	M	F	T	M	F	T	M	F	T	M	F	T
39	-	-	-	-	-	-	-	-	-	-	-	-
40	-	-	-	-	-	-	-	-	-	-	-	-
41	-	-	-	-	-	-	-	-	-	-	-	-
42	-	-	-	-	-	-	-	-	-	-	-	-
43	-	-	-	-	-	-	-	-	-	-	-	-
44	-	-	-	-	-	-	-	-	-	-	-	-
45	-	-	-	-	-	-	-	-	-	-	-	-
46	-	-	-	-	-	-	-	-	-	-	-	-
47	-	-	-	-	-	-	-	-	-	-	-	-
48	-	-	-	-	-	-	-	-	-	-	-	-
49	-	-	-	-	-	-	-	-	-	-	-	-
50	-	-	-	-	1	1	-	-	-	-	-	-
51	-	-	-	-	1	1	-	-	-	-	-	-
52	-	-	-	-	1	1	-	-	-	-	-	-
53	-	-	-	-	2	2	-	-	-	-	1	1
54	-	-	-	-	1	1	-	-	-	-	1	1
55	-	-	-	-	1	1	1	-	1	-	0	0
56	-	-	-	-	5	5	0	2	2	-	0	0
57	-	2	2	2	1	3	1	2	3	-	0	0
58	1	0	1	4	0	4	1	0	1	-	0	0
59	0	1	1	1	0	1	2	1	3	1	1	2
60	0	0	0	1	7	8	1	0	1	0	1	1
61	2	0	2	2	5	7	1	0	1	0	0	0
62	2	1	3	2	1	3	0	0	0	2	0	2
63	0	1	1	0	3	3	0	1	1	1	0	1
64	0	3	3	1	3	4	1	2	3	0	1	1
65	0	3	3	3	5	8	1	1	2	0	0	0
66	0	1	1	3	3	6	2	1	3	0	0	0
67	2	0	2	2	3	5	2	3	5	0	0	0
68	0	4	4	0	0	0	0	3	3	0	0	0
69	0	4	4	1	1	2	4	1	5	1	0	1
70	3	1	4	2	3	5	0	0	0	0	1	1
71	0	2	2	2	0	2	0	2	2	0	1	1
72	1	0	1	0	2	2	0	0	0	0	0	0
73	0	0	0	0	1	1	0	2	2	1	1	2
74	1	2	3	4	0	4	3	2	5	0	1	1
75	0	0	0	2	0	2	2	2	4	0	0	0
76	2	1	3	1	0	1	2	0	2	1	0	1
77	0	2	2	0	0	0	0	2	2	0	0	0
78	0	0	0	0	0	0	0	0	0	0	0	0
79	1	0	1	0	0	0	1	1	2	0	0	0
80	2	1	3	1	1	2	2	0	2	0	0	0
81	1	0	1	0	1	1	0	0	0	1	0	1

Appendix Table 4 (cont'd)

SET NO. TOTAL LENGTH (CM)	1			2			3			5		
	M	F	T	M	F	T	M	F	T	M	F	T
82	0	0	0	0	-	0	0	0	0	0	0	0
83	1	0	1	1	-	1	1	1	2	0	0	0
84	0	0	0	-	-	-	1	0	1	0	0	0
85	1	1	2	-	-	-	1	0	1	0	1	1
86	1	0	1	-	-	-	0	1	1	1	0	1
87	-	0	0	-	-	-	0	1	1	-	0	0
88	-	1	1	-	-	-	1	0	1	-	0	0
89	-	-	-	-	-	-	0	0	0	-	0	0
90	-	-	-	-	-	-	0	0	0	-	0	0
91	-	-	-	-	-	-	0	0	0	-	0	0
92	-	-	-	-	-	-	1	0	1	-	1	1
93	-	-	-	-	-	-	-	0	0	-	-	-
94	-	-	-	-	-	-	-	0	0	-	-	-
95	-	-	-	-	-	-	-	0	0	-	-	-
96	-	-	-	-	-	-	-	0	0	-	-	-
97	-	-	-	-	-	-	-	0	0	-	-	-
98	-	-	-	-	-	-	-	0	0	-	-	-
99	-	-	-	-	-	-	-	1	1	-	-	-
100	-	-	-	-	-	-	-	-	-	-	-	-
101	-	-	-	-	-	-	-	-	-	-	-	-
102	-	-	-	-	-	-	-	-	-	-	-	-
103	-	-	-	-	-	-	-	-	-	-	-	-
104	-	-	-	-	-	-	-	-	-	-	-	-
105	-	-	-	-	-	-	-	-	-	-	-	-
106	-	-	-	-	-	-	-	-	-	-	-	-
107	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	21	31	52	35	52	87	32	32	64	9	11	20

Appendix Table 4 (cont'd)

SET NO. TOTAL LENGTH (CM)	9			11			13			16		
	M	F	T	M	F	T	M	F	T	M	F	T
39	-	-	-	-	-	-	-	-	-	-	-	-
40	-	-	-	-	-	-	-	-	-	-	-	-
41	-	-	-	-	-	-	-	-	-	-	-	-
42	-	-	-	-	-	-	-	-	-	-	-	-
43	-	-	-	-	-	-	-	-	-	1	-	1
44	-	-	-	-	-	-	-	-	-	0	2	2
45	-	-	-	-	-	-	-	-	-	0	0	0
46	-	-	-	-	-	-	-	-	-	0	0	0
47	-	-	-	-	-	-	-	-	-	2	0	2
48	-	-	-	-	-	-	-	-	-	1	0	1
49	-	-	-	-	-	-	-	-	-	0	0	0
50	-	-	-	-	-	-	-	-	-	0	1	1
51	-	-	-	-	-	-	-	-	-	1	0	1
52	-	-	-	-	-	-	-	-	-	0	0	0
53	-	-	-	-	-	-	-	-	-	0	1	1
54	-	-	-	-	-	-	-	-	-	1	0	1
55	-	-	-	-	-	-	-	-	-	0	0	0
56	-	-	-	-	-	-	-	-	-	0	0	0
57	-	-	-	-	-	-	1	-	1	0	0	0
58	-	-	-	-	-	-	0	1	1	0	0	0
59	-	-	-	-	-	-	0	0	0	0	0	0
60	-	-	-	-	-	-	0	1	1	0	1	1
61	-	-	-	-	1	1	0	1	1	0	0	0
62	-	-	-	-	0	0	1	2	3	0	0	0
63	-	-	-	-	0	0	0	1	1	0	0	0
64	1	-	1	-	0	0	0	0	0	1	0	1
65	1	-	1	-	0	0	1	1	2	-	0	0
66	0	-	0	-	0	0	0	1	1	-	0	0
67	0	-	0	1	0	1	0	0	0	-	0	0
68	0	-	0	2	0	2	1	1	2	-	0	0
69	1	1	2	1	0	1	1	2	3	-	2	2
70	0	-	0	0	0	0	3	1	4	-	0	0
71	0	-	0	0	1	1	0	-	0	-	0	0
72	0	-	0	0	-	0	0	-	0	-	0	0
73	0	-	0	0	-	0	0	-	0	-	0	0
74	0	-	0	0	-	0	0	-	0	-	0	0
75	0	-	0	0	-	0	0	-	0	-	0	0
76	1	-	1	1	-	1	0	-	0	-	0	0
77	1	-	1	-	-	-	0	-	0	-	0	0
78	-	-	-	-	-	-	2	-	2	-	0	0
79	-	-	-	-	-	-	0	-	0	-	0	0
80	-	-	-	-	-	-	1	-	1	-	1	1
81	-	-	-	-	-	-	1	-	1	-	0	0

Appendix Table 4 (cont'd)

SET NO. TOTAL LENGTH (CM)	9			11			13			16		
	M	F	T	M	F	T	M	F	T	M	F	T
82	-	-	-	-	-	-	1	-	1	-	0	0
83	-	-	-	-	-	-	1	-	1	-	0	0
84	-	-	-	-	-	-	0	-	0	-	0	0
85	-	-	-	-	-	-	1	-	1	-	0	0
86	-	-	-	-	-	-	0	-	0	-	0	0
87	-	-	-	-	-	-	0	-	0	-	0	0
88	-	-	-	-	-	-	0	-	0	-	0	0
89	-	-	-	-	-	-	0	-	0	-	0	0
90	-	-	-	-	-	-	1	-	1	-	0	0
91	-	-	-	-	-	-	-	-	-	-	0	0
92	-	-	-	-	-	-	-	-	-	-	0	0
93	-	-	-	-	-	-	-	-	-	-	1	1
94	-	-	-	-	-	-	-	-	-	-	1	1
95	-	-	-	-	-	-	-	-	-	-	0	0
96	-	-	-	-	-	-	-	-	-	-	0	0
97	-	-	-	-	-	-	-	-	-	-	0	0
98	-	-	-	-	-	-	-	-	-	-	0	0
99	-	-	-	-	-	-	-	-	-	-	0	0
100	-	-	-	-	-	-	-	-	-	-	0	0
101	-	-	-	-	-	-	-	-	-	-	1	1
102	-	-	-	-	-	-	-	-	-	-	0	0
103	-	-	-	-	-	-	-	-	-	-	0	0
104	-	-	-	-	-	-	-	-	-	-	1	1
105	-	-	-	-	-	-	-	-	-	-	0	0
106	-	-	-	-	-	-	-	-	-	-	1	1
107	-	-	-	-	-	-	-	-	-	-	1	1
TOTAL	5	1	6	5	2	7	16	12	28	7	14	21

Appendix Table 4 (cont'd)

SET NO. TOTAL LENGTH (CM)	17			22			23			24		
	M	F	T	M	F	T	M	F	T	M	F	T
39	-	-	-	-	-	-	-	-	-	-	-	-
40	-	-	-	-	-	-	-	-	-	-	-	-
41	-	-	-	-	-	-	-	-	-	-	-	-
42	-	-	-	-	-	-	-	-	-	-	-	-
43	-	-	-	-	-	-	-	-	-	-	-	-
44	-	-	-	-	-	-	-	-	-	-	-	-
45	-	-	-	-	-	-	-	-	-	-	-	-
46	-	-	-	-	-	-	-	-	-	-	-	-
47	-	-	-	-	-	-	-	-	-	-	-	-
48	-	-	-	-	-	-	-	-	-	-	-	-
49	-	-	-	-	-	-	-	-	-	-	-	-
50	-	-	-	-	-	-	-	-	-	-	-	-
51	-	-	-	-	-	-	-	-	-	-	-	-
52	-	-	-	-	-	-	-	-	-	-	-	-
53	-	-	-	-	-	-	-	-	-	-	-	-
54	-	-	-	-	-	-	-	2	2	-	-	-
55	-	-	-	-	-	-	-	0	0	-	-	-
56	-	-	-	-	-	-	-	1	1	-	-	-
57	-	-	-	-	-	-	2	0	2	-	-	-
58	-	-	-	-	-	-	0	2	2	-	-	-
59	-	-	-	-	-	-	2	2	4	-	-	-
60	-	-	-	1	-	1	3	0	3	-	1	1
61	-	-	-	0	-	0	0	1	1	-	0	0
62	-	-	-	1	-	1	1	2	3	-	0	0
63	-	-	-	1	-	1	1	0	1	-	0	0
64	-	-	-	1	3	4	0	1	1	-	0	0
65	-	-	-	0	0	0	0	3	3	2	1	3
66	-	-	-	1	3	4	1	0	1	0	1	1
67	-	-	-	1	1	2	3	1	4	0	0	0
68	-	-	-	1	1	2	3	1	4	0	0	0
69	-	-	-	0	1	1	1	1	2	1	0	1
70	-	-	-	0	1	1	0	1	1	1	0	1
71	-	-	-	1	1	2	2	0	2	0	0	0
72	-	-	-	1	0	1	2	1	3	0	0	0
73	-	-	-	2	1	3	2	0	2	0	0	0
74	-	-	-	2	0	2	3	0	3	1	1	2
75	-	-	-	0	0	0	0	0	0	1	-	1
76	-	-	-	0	2	2	1	0	1	0	-	0
77	-	-	-	0	2	2	0	1	1	1	-	1
78	-	-	-	2	0	2	1	-	1	0	-	0
79	-	-	-	3	0	3	1	-	1	0	-	0
80	-	-	-	2	0	2	0	-	0	5	-	5
81	-	-	-	2	0	2	2	-	2	3	-	3

Appendix Table 4 (cont'd)

SET NO.	17			22			23			24		
TOTAL LENGTH (CM)	M	F	T	M	F	T	M	F	T	M	F	T
82	-	-	-	1	2	3	5	-	5	1	-	1
83	-	-	-	9	1	10	5	-	5	3	-	3
84	-	-	-	2	0	2	3	-	3	1	-	1
85	-	-	-	2	0	2	2	-	2	3	-	3
86	-	-	-	4	0	4	1	-	1	0	-	0
87	-	-	-	2	0	2	1	-	1	1	-	1
88	-	-	-	3	1	4	5	-	5	0	-	0
89	-	2	2	2	0	2	1	-	1	1	-	1
90	-	0	0	0	0	0	1	-	1	2	-	2
91	-	2	2	1	0	1	0	-	0	1	-	1
92	-	0	0	1	1	2	1	-	1	-	-	-
93	-	0	0	-	-	-	-	-	-	-	-	-
94	-	0	0	-	-	-	-	-	-	-	-	-
95	-	0	0	-	-	-	-	-	-	-	-	-
96	-	0	0	-	-	-	-	-	-	-	-	-
97	-	0	0	-	-	-	-	-	-	-	-	-
98	-	0	0	-	-	-	-	-	-	-	-	-
99	-	1	1	-	-	-	-	-	-	-	-	-
100	-	4	4	-	-	-	-	-	-	-	-	-
101	-	1	1	-	-	-	-	-	-	-	-	-
102	-	4	4	-	-	-	-	-	-	-	-	-
103	-	1	1	-	-	-	-	-	-	-	-	-
104	-	1	1	-	-	-	-	-	-	-	-	-
105	-	2	2	-	-	-	-	-	-	-	-	-
106	-	-	-	-	-	-	-	-	-	-	-	-
107	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	0	18	18	49	21	70	56	20	76	28	4	32

Appendix Table 4 (cont'd)

SET NO. TOTAL LENGTH (CM)	25			28			30			31		
	M	F	T	M	F	T	M	F	T	M	F	T
39	-	-	-	-	-	-	-	-	-	-	-	-
40	1	-	1	-	-	-	-	-	-	-	-	-
41	0	-	0	-	-	-	-	-	-	-	-	-
42	0	-	0	-	-	-	-	-	-	-	-	-
43	0	-	0	-	-	-	-	-	-	-	-	-
44	0	-	0	-	-	-	-	-	-	-	-	-
45	0	1	1	-	-	-	-	-	-	-	-	-
46	0	0	0	-	-	-	-	-	-	-	-	-
47	0	1	1	-	-	-	1	-	1	-	-	-
48	1	0	1	-	-	-	0	-	0	-	-	-
49	0	0	0	-	1	1	0	-	0	-	-	-
50	0	0	0	-	0	0	0	-	0	-	-	-
51	1	0	1	-	0	0	0	1	1	-	-	-
52	0	1	1	-	0	0	1	0	1	-	1	1
53	0	0	0	-	0	0	0	1	1	-	0	0
54	0	0	0	-	0	0	0	0	0	1	0	1
55	0	0	0	-	0	0	0	1	1	0	0	0
56	0	0	0	1	0	1	1	0	1	0	0	0
57	0	0	0	0	0	0	2	0	2	0	0	0
58	0	0	0	2	1	3	1	3	4	0	0	0
59	0	0	0	0	2	2	0	1	1	0	0	0
60	0	1	1	0	1	1	1	2	3	0	0	0
61	0	0	0	0	1	1	1	1	2	0	0	0
62	0	1	1	0	1	1	2	0	2	0	0	0
63	0	1	1	1	1	2	2	0	2	1	1	2
64	0	1	1	0	3	3	1	1	2	1	0	1
65	0	-	0	0	1	1	0	1	1	1	0	1
66	0	-	0	0	2	2	0	1	1	0	1	1
67	1	-	1	2	1	3	0	-	0	1	0	1
68	0	-	0	1	0	1	0	-	0	1	1	2
69	0	-	0	0	0	0	0	-	0	2	0	2
70	0	-	0	1	0	1	0	-	0	1	0	1
71	0	-	0	2	0	2	0	-	0	0	0	0
72	0	-	0	1	0	1	0	-	0	4	0	4
73	0	-	0	0	0	0	0	-	0	0	0	0
74	0	-	0	0	0	0	0	-	0	2	0	2
75	0	-	0	0	0	0	1	-	1	0	0	0
76	1	-	1	1	0	1	0	-	0	1	0	1
77	0	-	0	1	0	1	0	-	0	0	0	0
78	0	-	0	-	0	0	0	-	0	1	0	1
79	0	-	0	-	0	0	0	-	0	0	0	0
80	0	-	0	-	0	0	1	-	1	0	0	0
81	0	-	0	-	0	0	0	-	0	0	0	0

Appendix Table 4 (cont'd)

SET NO. TOTAL LENGTH (CM)	25			28			30			31		
	M	F	T	M	F	T	M	F	T	M	F	T
82	1	-	1	-	0	0	0	-	0	3	0	3
83	3	-	3	-	1	1	0	-	0	-	0	0
84	0	-	0	-	1	1	0	-	0	-	0	0
85	1	-	1	-	-	-	0	-	0	-	0	0
86	2	-	2	-	-	-	1	-	1	-	0	0
87	0	-	0	-	-	-	-	-	-	-	0	0
88	0	-	0	-	-	-	-	-	-	-	0	0
89	1	-	1	-	-	-	-	-	-	-	0	0
90	-	-	-	-	-	-	-	-	-	-	0	0
91	-	-	-	-	-	-	-	-	-	-	0	0
92	-	-	-	-	-	-	-	-	-	-	0	0
93	-	-	-	-	-	-	-	-	-	-	0	0
94	-	-	-	-	-	-	-	-	-	-	0	0
95	-	-	-	-	-	-	-	-	-	-	0	0
96	-	-	-	-	-	-	-	-	-	-	0	0
97	-	-	-	-	-	-	-	-	-	-	0	0
98	-	-	-	-	-	-	-	-	-	-	0	0
99	-	-	-	-	-	-	-	-	-	-	0	0
100	-	-	-	-	-	-	-	-	-	-	0	0
101	-	-	-	-	-	-	-	-	-	-	0	0
102	-	-	-	-	-	-	-	-	-	-	0	0
103	-	-	-	-	-	-	-	-	-	-	1	1
104	-	-	-	-	-	-	-	-	-	-	-	-
105	-	-	-	-	-	-	-	-	-	-	-	-
106	-	-	-	-	-	-	-	-	-	-	-	-
107	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	13	7	20	13	17	30	16	13	29	20	5	25

Appendix Table 4 (cont'd)

SET NO. TOTAL LENGTH (CM)	32			33			34			35		
	M	F	T	M	F	T	M	F	T	M	F	T
39	1	-	1	-	1	1	-	-	-	-	-	-
40	0	-	0	-	0	0	-	-	-	-	-	-
41	0	-	0	-	0	0	-	-	-	-	-	-
42	0	-	0	-	0	0	-	-	-	-	-	-
43	0	-	0	-	0	0	-	-	-	-	-	-
44	0	-	0	-	0	0	-	-	-	-	-	-
45	0	-	0	-	0	0	-	-	-	-	-	-
46	0	-	0	-	0	0	-	-	-	-	-	-
47	0	-	0	-	0	0	-	-	-	-	-	-
48	0	-	0	-	1	1	-	-	-	-	-	-
49	0	-	0	-	0	0	-	-	-	-	-	-
50	0	-	0	-	1	1	-	1	1	-	-	-
51	0	-	0	-	0	0	-	1	1	-	-	-
52	0	-	0	1	1	2	-	0	0	-	-	-
53	0	1	1	0	0	0	1	0	1	-	-	-
54	1	0	1	0	1	1	3	0	3	-	-	-
55	0	0	0	0	2	2	0	0	0	-	-	-
56	0	0	0	1	5	6	1	0	1	-	-	-
57	2	1	3	0	1	1	0	0	0	-	-	-
58	1	1	2	2	0	2	2	0	2	-	-	-
59	0	1	1	1	2	3	1	1	2	-	1	1
60	1	2	3	0	2	2	1	1	2	2	0	2
61	1	1	2	0	2	2	1	0	1	0	0	0
62	2	1	3	1	2	3	2	0	2	0	1	1
63	0	1	1	1	0	1	1	1	2	0	1	1
64	1	0	1	1	1	2	1	2	3	3	1	4
65	0	2	2	1	1	2	0	0	0	1	0	1
66	0	0	0	2	0	2	0	0	0	2	0	2
67	0	2	2	0	0	0	0	1	1	2	0	2
68	0	0	0	0	0	0	0	0	0	0	0	0
69	1	0	1	1	0	1	0	1	1	0	1	1
70	1	1	2	1	0	1	2	1	3	0	-	0
71	0	0	0	0	1	1	0	0	0	0	-	0
72	1	1	2	0	1	1	0	0	0	0	-	0
73	1	0	1	0	0	0	0	1	1	1	-	1
74	1	0	1	0	1	1	1	0	1	0	-	0
75	0	0	0	0	-	0	0	0	0	0	-	0
76	1	0	1	1	-	1	0	0	0	1	-	1
77	0	0	0	0	-	0	0	0	0	0	-	0
78	0	0	0	0	-	0	1	0	1	0	-	0
79	0	0	0	0	-	0	0	0	0	0	-	0
80	0	0	0	0	-	0	0	0	0	1	-	1
81	0	0	0	0	-	0	0	0	0	-	-	-

Appendix Table 4 (cont'd)

SET NO. TOTAL LENGTH (CM)	32			33			34			35		
	M	F	T	M	F	T	M	F	T	M	F	T
82	1	0	1	1	–	1	0	0	0	–	–	–
83	1	0	1	0	–	0	2	0	2	–	–	–
84	–	0	0	1	–	1	0	0	0	–	–	–
85	–	0	0	–	–	–	1	0	1	–	–	–
86	–	0	0	–	–	–	–	0	0	–	–	–
87	–	0	0	–	–	–	–	1	1	–	–	–
88	–	0	0	–	–	–	–	–	–	–	–	–
89	–	0	0	–	–	–	–	–	–	–	–	–
90	–	0	0	–	–	–	–	–	–	–	–	–
91	–	1	1	–	–	–	–	–	–	–	–	–
92	–	–	–	–	–	–	–	–	–	–	–	–
93	–	–	–	–	–	–	–	–	–	–	–	–
94	–	–	–	–	–	–	–	–	–	–	–	–
95	–	–	–	–	–	–	–	–	–	–	–	–
96	–	–	–	–	–	–	–	–	–	–	–	–
97	–	–	–	–	–	–	–	–	–	–	–	–
98	–	–	–	–	–	–	–	–	–	–	–	–
99	–	–	–	–	–	–	–	–	–	–	–	–
100	–	–	–	–	–	–	–	–	–	–	–	–
101	–	–	–	–	–	–	–	–	–	–	–	–
102	–	–	–	–	–	–	–	–	–	–	–	–
103	–	–	–	–	–	–	–	–	–	–	–	–
104	–	–	–	–	–	–	–	–	–	–	–	–
105	–	–	–	–	–	–	–	–	–	–	–	–
106	–	–	–	–	–	–	–	–	–	–	–	–
107	–	–	–	–	–	–	–	–	–	–	–	–
TOTAL	18	16	34	16	26	42	21	12	33	13	5	18

Appendix Table 4 (cont'd)

SET NO. TOTAL LENGTH (CM)	37			TOTAL		
	M	F	T	M	F	T
39	-	-	-	1	1	2
40	-	-	-	1	0	1
41	-	-	-	0	0	0
42	-	-	-	0	0	0
43	-	-	-	1	0	1
44	-	-	-	0	2	2
45	-	-	-	0	1	1
46	-	-	-	0	0	0
47	-	-	-	3	1	4
48	-	-	-	2	1	3
49	-	-	-	0	1	1
50	-	-	-	0	4	4
51	-	-	-	2	3	5
52	-	1	1	2	5	7
53	2	0	2	3	6	9
54	0	1	1	6	6	12
55	0	0	0	1	4	5
56	1	2	3	5	15	20
57	0	4	4	10	11	21
58	3	1	4	17	9	26
59	0	1	1	8	14	22
60	6	1	7	17	21	38
61	4	6	10	12	19	31
62	2	5	7	18	17	35
63	0	3	3	9	15	24
64	1	3	4	14	25	39
65	4	2	6	15	21	36
66	4	2	6	15	16	31
67	0	2	2	17	14	31
68	0	5	5	9	16	25
69	0	2	2	15	17	32
70	2	3	5	17	13	30
71	4	0	4	11	8	19
72	1	1	2	11	6	17
73	1	1	2	8	7	15
74	0	-	0	18	7	25
75	0	-	0	6	2	8
76	1	-	1	16	3	19
77	1	-	1	4	7	11
78	0	-	0	7	0	7
79	1	-	1	7	1	8
80	0	-	0	15	3	18
81	0	-	0	10	1	11

Appendix Table 4 (cont'd)

SET NO. TOTAL LENGTH (CM)	37			TOTAL		
	M	F	T	M	F	T
82	0	-	0	14	2	16
83	1	-	1	28	3	31
84	0	-	0	8	1	9
85	0	-	0	12	2	14
86	1	-	1	11	1	12
87	1	-	1	5	2	7
88	-	-	-	9	2	11
89	-	-	-	5	2	7
90	-	-	-	4	0	4
91	-	-	-	2	3	5
92	-	-	-	3	2	5
93	-	-	-	-	1	1
94	-	-	-	-	1	1
95	-	-	-	-	0	0
96	-	-	-	-	0	0
97	-	-	-	-	0	0
98	-	-	-	-	0	0
99	-	-	-	-	2	2
100	-	-	-	-	4	4
101	-	-	-	-	2	2
102	-	-	-	-	4	4
103	-	-	-	-	2	2
104	-	-	-	-	2	2
105	-	-	-	-	2	2
106	-	-	-	-	1	1
107	-	-	-	-	1	1
TOTAL	41	46	87	434	365	799

Appendix Table 5. Lingcod length frequency. F/V CALEDONIAN, August 12-25, 1986.

SET NO.	3			13			20			TOTAL		
FORK LENGTH (CM)	M	F	T	M	F	T	M	F	T	M	F	T
67	-	-	-	-	-	-	-	1	1	-	1	1
68	-	-	-	-	-	-	-	0	0	-	0	0
69	-	-	-	1	-	1	-	0	0	1	0	1
70	-	-	-	-	-	-	-	0	0	-	0	0
71	-	-	-	-	-	-	-	0	0	-	0	0
72	-	-	-	-	-	-	-	0	0	-	0	0
73	-	-	-	-	-	-	-	0	0	-	0	0
74	-	-	-	-	-	-	-	0	0	-	0	0
75	-	-	-	-	-	-	-	0	0	-	0	0
76	-	-	-	-	-	-	-	0	0	-	0	0
77	-	-	-	-	-	-	-	0	0	-	0	0
78	-	-	-	-	-	-	-	0	0	-	0	0
79	-	-	-	-	-	-	-	0	0	-	0	0
80	-	-	-	-	-	-	-	0	0	-	0	0
81	-	1	1	-	-	-	-	0	0	-	1	1
82	-	-	-	-	-	-	-	0	0	-	0	0
83	-	-	-	-	-	-	-	0	0	-	0	0
84	-	-	-	-	-	-	-	0	0	-	0	0
85	-	-	-	-	-	-	-	0	0	-	0	0
86	-	-	-	-	-	-	-	0	0	-	0	0
87	-	-	-	-	-	-	-	0	0	-	0	0
88	-	-	-	-	-	-	-	0	0	-	0	0
89	-	-	-	-	-	-	-	0	0	-	0	0
90	-	-	-	-	-	-	-	0	0	-	0	0
91	-	-	-	-	-	-	-	0	0	-	0	0
92	-	-	-	-	-	-	-	0	0	-	0	0
93	-	-	-	-	-	-	-	1	1	-	1	1
TOTAL	0	1	1	1	0	1	0	2	2	1	3	4

Appendix Table 6. Pacific cod length frequency. F/V CALEDONIAN, August 12-25, 1986.

SET NO.	1			3			5			TOTAL		
FORK LENGTH (CM)	M	F	T	M	F	T	M	F	T	M	F	T
26	-	1	1	-	-	-	-	-	-	-	1	1
27	-	0	0	-	-	-	-	-	-	-	0	0
28	-	0	0	-	-	-	-	-	-	-	0	0
29	1	1	2	-	-	-	-	1	1	1	2	3
30	0	1	1	-	-	-	1	0	1	1	1	2
31	0	0	0	-	-	-	0	1	1	0	1	1
32	0	0	0	-	-	-	0	0	0	0	0	0
33	0	0	0	-	-	-	0	0	0	0	0	0
34	1	0	1	-	-	-	1	0	1	2	0	2
35	-	0	0	1	1	2	0	0	0	1	1	2
36	-	0	0	0	-	0	0	1	1	0	1	1
37	-	0	0	0	-	0	0	0	0	0	0	0
38	-	0	0	0	-	0	0	0	0	0	0	0
39	-	0	0	0	-	0	1	0	1	1	0	1
40	-	0	0	0	-	0	-	0	0	0	0	0
41	-	0	0	0	-	0	-	0	0	0	0	0
42	-	0	0	1	-	1	-	0	0	1	0	1
43	-	0	0	0	-	0	-	0	0	0	0	0
44	-	0	0	0	-	0	-	0	0	0	0	0
45	-	0	0	0	-	0	-	0	0	0	0	0
46	-	0	0	0	-	0	-	0	0	0	0	0
47	-	0	0	1	-	1	-	0	0	1	0	1
48	-	0	0	-	-	-	-	0	0	-	0	0
49	-	0	0	-	-	-	-	0	0	-	0	0
50	-	0	0	-	-	-	-	0	0	-	0	0
51	-	0	0	-	-	-	-	0	0	-	0	0
52	-	0	0	-	-	-	-	0	0	-	0	0
53	-	0	0	-	-	-	-	0	0	-	0	0
54	-	0	0	-	-	-	-	0	0	-	0	0
55	-	0	0	-	-	-	-	0	0	-	0	0
56	-	0	0	-	-	-	-	0	0	-	0	0
57	-	0	0	-	-	-	-	0	0	-	0	0
58	-	0	0	-	-	-	-	0	0	-	0	0
59	-	0	0	-	-	-	-	0	0	-	0	0
60	-	0	0	-	-	-	-	0	0	-	0	0
61	-	0	0	-	-	-	-	0	0	-	0	0
62	-	0	0	-	-	-	-	0	0	-	0	0
63	-	0	0	-	-	-	-	0	0	-	0	0
64	-	0	0	-	-	-	-	0	0	-	0	0
65	-	0	0	-	-	-	-	0	0	-	0	0
66	-	0	0	-	-	-	-	0	0	-	0	0
67	-	0	0	-	-	-	-	0	0	-	0	0
68	-	0	0	-	-	-	-	1	1	-	1	1

Appendix Table 6 (cont'd)

SET NO.	1			3			5			TOTAL		
FORK LENGTH (CM)	M	F	T	M	F	T	M	F	T	M	F	T
69	-	0	0	-	-	-	-	-	-	-	0	0
70	-	0	0	-	-	-	-	-	-	-	0	0
71	-	0	0	-	-	-	-	-	-	-	0	0
72	-	0	0	-	-	-	-	-	-	-	0	0
73	-	0	0	-	-	-	-	-	-	-	0	0
74	-	0	0	-	-	-	-	-	-	-	0	0
75	-	0	0	-	-	-	-	-	-	-	0	0
76	-	1	1	-	-	-	-	-	-	-	1	1
TOTAL	2	4	6	3	1	4	3	4	7	8	9	17

Appendix Table 7. Walleye pollock length frequency. F/V CALEDONIAN, August 12-25, 1986.

SET NO.	1			4			5			11		
FORK LENGTH (CM)	M	F	T	M	F	T	M	F	T	M	F	T
23	1	-	1	-	-	-	1	1	2	-	-	-
24	0	-	0	-	-	-	3	3	6	-	-	-
25	4	3	7	-	-	-	6	8	14	-	-	-
26	1	1	2	-	-	-	12	14	26	-	-	-
27	2	4	6	-	-	-	10	13	23	-	-	-
28	3	5	8	-	-	-	7	17	24	-	-	-
29	3	1	4	-	-	-	9	5	14	-	-	-
30	2	3	5	-	-	-	3	3	6	-	-	-
31	1	0	1	-	-	-	4	2	6	-	-	-
32	0	0	0	-	-	-	1	0	1	-	-	-
33	0	0	0	-	-	-	0	1	1	-	-	-
34	0	0	0	-	-	-	0	1	1	-	-	-
35	0	0	0	-	1	1	0	0	0	-	1	1
36	2	0	2	-	0	0	1	1	2	1	0	1
37	0	1	1	-	0	0	1	0	1	2	0	2
38	0	0	0	-	0	0	0	1	1	0	3	3
39	1	2	3	-	0	0	0	0	0	2	3	5
40	0	1	1	1	0	1	0	1	1	3	8	11
41	1	1	2	0	0	0	0	2	2	2	8	10
42	0	2	2	2	1	3	0	0	0	0	7	7
43	1	0	1	0	2	2	0	0	0	3	5	8
44	1	1	2	1	2	3	0	0	0	5	5	10
45	0	0	0	1	3	4	0	1	1	6	5	11
46	1	2	3	0	1	1	0	0	0	8	6	14
47	2	2	4	1	1	2	1	0	1	5	6	11
48	0	1	1	1	1	2	0	0	0	5	11	16
49	1	0	1	0	1	1	0	0	0	2	8	10
50	0	3	3	1	1	2	0	0	0	0	14	14
51	0	0	0	1	3	4	0	0	0	0	14	14
52	0	1	1	-	1	1	1	1	2	0	11	11
53	0	1	1	-	0	0	-	0	0	1	20	21
54	0	-	0	-	1	1	-	1	1	0	23	23
55	1	-	1	-	0	0	-	-	-	0	10	10
56	-	-	-	-	1	1	-	-	-	0	13	13
57	-	-	-	-	-	-	-	-	-	0	1	1
58	-	-	-	-	-	-	-	-	-	1	2	3
59	-	-	-	-	-	-	-	-	-	-	2	2
60	-	-	-	-	-	-	-	-	-	-	0	0
61	-	-	-	-	-	-	-	-	-	-	1	1
TOTAL	28	35	63	9	20	29	60	76	136	46	187	233

Appendix Table 7 (cont'd)

SET NO. FORK LENGTH (CM)	TOTAL		
	M	F	T
23	2	1	3
24	3	3	6
25	10	11	21
26	13	15	28
27	12	17	29
28	10	22	32
29	12	6	18
30	5	6	11
31	5	2	7
32	1	0	1
33	0	1	1
34	0	1	1
35	0	2	2
36	4	1	5
37	3	1	4
38	0	4	4
39	3	5	8
40	4	10	14
41	3	11	14
42	2	10	12
43	4	7	11
44	7	8	15
45	7	9	16
46	9	9	18
47	9	9	18
48	6	13	19
49	3	9	12
50	1	18	19
51	1	17	18
52	1	14	15
53	1	21	22
54	0	25	25
55	1	10	11
56	0	14	14
57	0	1	1
58	1	2	3
59	-	2	2
60	-	0	0
61	-	1	1
TOTAL	143	318	461